The newsweekly of enterprise network computing

NetworkWorld

September 20, 1999 Volume 16, Number 38 www.nwfusion.com

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See inside for complete details!

See the Sponsor Showcase for important information on leading Storage Solution providers.

TURN TO INSIDE BACK COVER

Program Agenda

Join storage guru David Hill, Senior Analyst, Storage and Storage Management from Aberdeen Group, and *Network World* Executive Editor of News, Doug Barney, as they discuss why storage has become such a challenge, and how you can become a storage hero by getting it all under control. Next, the leading storage vendors will explain exactly how they propose to handle your ever-increasing storage needs, whether through network attached storage, which ties storage to special file servers that ship files off to end users, or the new world of storage area networking where multiple servers connect to multiple storage systems.

8:00-9:00 **Registration and Power Breakfast**

Take this opportunity to network with your peers and establish relationships with vendors who can aid you in reaching your storage management goals.

9:00-9:30 **Moderator's Keynote — Building Your Network Storage Foundation**

Storage expert David Hill will explain the critical issues in storage today, and help you avoid the pitfalls in building a networked storage system. Learn everything you need to know about switches, hubs, servers and storage controllers. Get the latest on tape technology, and find out what role LANs and WANs will play in future storage networks. Lastly, David will help you learn to manage your new storage system.

9:30-10:30 **Vendor Strategies for Storage Networking** (Part 1)

You know what the problem is: there's too much data and not enough well architected storage. Our top-flight vendors will explain just how they can help you. They will detail their product lines, explain their architectures and give a hint of things to come. Topics include blending storage subsystems into a storage area network (SAN); creating serverless backup; and managing your SAN.

10:30-11:00 **Break and Product Information**

11:00-12:00 **More Vendor Strategies for Storage Networking** (Part 2)

12:00-12:30 **Roundtable Discussion**

Network World's Doug Barney will lead a hard-hitting discussion with the vendor panel about how networked storage will benefit the enterprise, how the different approaches stack up, and what you should expect from vendors in the future. You will then have the opportunity to direct your own questions to the panel in what is sure to be a lively Q&A session.

12:30-1:30 **Complimentary Lunch and Product Information**

1:30-2:15 **Storage Futures and Q&A**

David Hill and each of the sponsors will summarize the issues that were raised during the program and offer one final look at the future directions of storage technology. The program will conclude with a final roundtable discussion and audience Q&A session lead by Doug Barney.

2:15 **Closing Remarks and Raffle**

Throughout the day you'll have the chance to enter a raffle to win a DVD player. You must be present at time of drawing to win.

Learn from the Leaders

David Hill
Aberdeen Group

Doug Barney
Network World

David Hill has 30 years of experience in the IT field, with a strong emphasis on storage management, decision support systems and internal IT management. He focuses especially on new storage technologies such as Fibre Channel and new uses of storage software such as intelligent agents for event-driven, service-level management. David also concentrates on how forward-thinking enterprises can leverage their storage technology investments to control costs, generate more revenue and increase margins.

Doug Barney is Executive Editor of News for *Network World* and drives the online and print news operations. He offers a wide range of knowledge on today's hottest computing issues ranging from the latest in storage technology to racism on the Internet and current telecom reform issues. Mr. Barney is a regularly featured guest industry expert on local and national radio and television news/talk shows. A 15 year computer journalism veteran, Barney has written for InfoWorld, ComputerWorld, and was Editor in Chief of AmigaWorld Magazine.

Tour Dates and Locations

Boston, MA	October 6	Sheraton Boston Hotel
New York, NY	October 7	New York Marriott Financial Center
Chicago, IL	October 20	Rosemont Convention Center
Washington, DC	October 21	Hyatt Regency Bethesda
Atlanta, GA	November 10	Grand Hyatt
Dallas, TX	November 11	The Fairmont Hotel
Los Angeles, CA	December 1	Downtown L.A. Marriott
San Francisco, CA	December 2	Sheraton Palace Hotel

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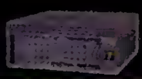
CACHING IN Novell details the features of its Internet Caching System Version 2, expected early next year. Page 6.



EXTREME SWITCHING Extreme Networks bolsters its Gigabit Ethernet switch line. Page 12.

The newsweekly of enterprise network computing
NetworkWorld

MAKING AMENDS

After its frame relay outage last month, MCI WorldCom is looking to appease customers. Page 14.

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The network portal: www.nwfusion.com

CONVERGENCE SHOWDOWN COMBATANTS

B. Roman 3Com | M. De Beer Cisco | K. Mashima Lucent | R. Pereira Cabletron | T.J. Fitzpatrick Nortel | S. Pickett Vertical Networks

PHOTOS ALLEN WEINER

Convergence divergence

Vendor debate reveals interoperability issues, spotty product plans.

NetworkWorld SHOWDOWN Convergence

BY JIM DUFFY

ATLANTA — Despite the hype surrounding the benefits of convergence, vendors' strategies remain largely incomplete and concerns about the reliability of data networks to carry voice are pervasive.

These were the general conclusions after *Network World's* Convergence Showdown last week at NetWorld+Interop '99 Atlanta. The presidential-style debate featured representatives of 3Com, Cabletron, Cisco, Lucent, Nortel Networks and Vertical Networks.

While there were no clear winners, holes in vendors' plans were exposed and a host of unresolved issues were brought to the surface.

"I was struck by how much work we still have to do on this

See **Showdown**, page 75

NetWorld+Interop 99 Atlanta 1999

More N+I News

- Network chip makers join forces. Page 8.
- VPN vendors stress reliability. Page 11.
- A *Network World* exclusive on new 3Com and Nortel switching gear. Page 12.
- The wacky side of Interop. Page 14.
- AT&T lays out broadband access plan. Page 16.
- Additional coverage throughout the issue.

Pentagon gets 'smart'

Military smart cards will access nets, encrypt data.

BY ELLEN MESSMER

WASHINGTON, D.C. — The U.S. military says it will phase out plastic identification cards in favor of a chip-based multi-application smart card that about 800,000 personnel will carry.

The Defense Department smart card will hold digital certificates that will allow the holder to sign and encrypt documents or purchase orders, and will be the means to access networks managed by the Army, Navy, Air Force and Marines.

This smart card ID will also

See **Smart card**, page 77

Newspaper $5.00

The next best thing to IPv6?

BY CAROLYN DUFFY MARSAN

IPv6 may have an understudy waiting in the wings.

The Internet engineering community, concerned about the snail-paced deployment of IPv6, has begun revving up development of a protocol that could serve as either an interim measure or an alternative to the next major version of the Internet communications protocol.

Currently in draft form, the Realm Specific Internet Protocol (RSIP) solves some of the addressing constraints of today's IPv4. RSIP also supports end-to-end security and allows for a smooth transition to emerging Internet applications, such as teleconferencing, instant messaging, streaming media and telephony (see Scoop, page 76). RSIP would reside in client and router gear.

For enterprise network users, RSIP offers a replacement for Network Address Translation (NAT), a common IPv4 workaround used by organizations to support multiple private addresses through a single public Internet address. RSIP also could be used to aid in the transition from IPv4 to IPv6, which will be a daunting

See **IPv6**, page 76

More Online

- Details of Realm Specific Internet Protocol.
- Notes from the July Internet Architecture Board meeting.

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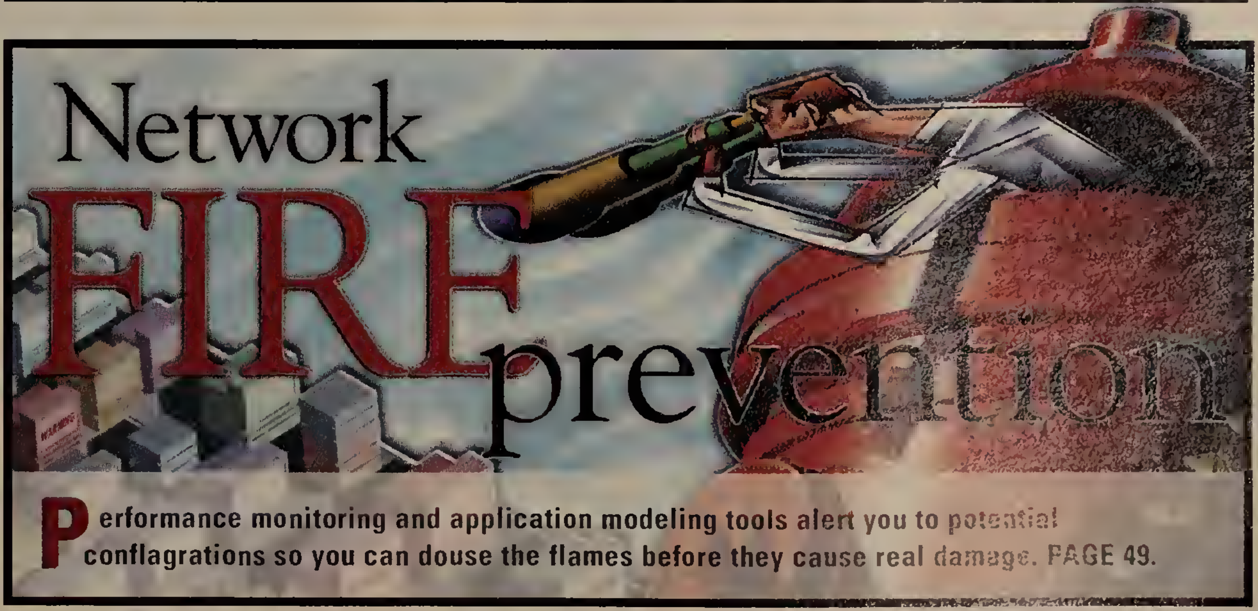

Performance monitoring and application modeling tools alert you to potential conflagrations so you can douse the flames before they cause real damage. PAGE 49.

VAL MINA

*Includes Digital and Compaq market share. Excerpted from Infobeads Study, ZDMI Technology Database, "Installed Base Marketshare of Web Servers," 8/5/99. Compaq, the Compaq logo, ProLiant, AlphaServer, NonStop Himalaya and NonStop e-Business are registered trademarks, Tru64 is a trademark and Better answers is a service mark of Compaq Computer Corporation. Microsoft Windows NT is a registered trademark of Microsoft Corporation. UNIX is a registered trademark in the U.S. and other countries, licensed exclusively through X/Open Company Ltd. drugstore.com is a registered service mark licensed from drugstore.com, Inc. Oracle is a registered trademark and Oracle8 is a trademark of Oracle Corporation. All other names are trademarks or registered trademarks of their respective companies. ©1999 Compaq Computer Corp. All rights reserved.

Be up all hours? For Compaq servers, no problem. That's why so many e-businesses trust them. And why Compaq's Web server market share is 28.9% vs. Sun's 14.6% and IBM's 13.1%*. Also, Compaq servers are peak-hour speed demons. Making customers happy and e-businesses grow. For example, after its first six months, drugstore.com® became the 7th largest e-tail site in the U.S. (according to PC Data, Inc., 6/99). Their Compaq solution (ProLiant and AlphaServer systems running Oracle8™) kept up with the growth, as did their equally scalable Compaq storage. Another good thing: as Compaq NonStop® e-Business Solutions, AlphaServer systems include a full suite of Internet management software, built in. For more, visit www.compaq.com/alwaysopen, contact your reseller or call 1-800-AT-COMPAQ.

Your server is
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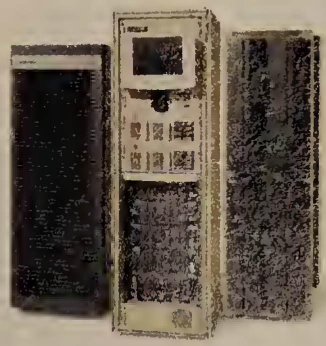
Are the doors
always open?



Why Compaq?
Says drugstore.com CIO Kal Raman, "One of the big advantages of working with Compaq is the support we get. They replaced Sun platforms with a seamless integration of Compaq ProLiant running Windows NT® and AlphaServer systems running Tru64 UNIX,® in record time."
Left to right: Compaq AlphaServer, Compaq ProLiant, Compaq NonStop Himalaya

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BigIron 8000 Switch & Switching Router

Whenever top-tier ISPs like AOL®, Yahoo!® and MindSpring® cry out for maximum speed, we heed their call. When enterprises like First Union National Bank, LTV Steel and Carnival® Cruise Lines grasp for reliability, we leap to the rescue. And when organizations like the University of Southern California and the National Institutes of Health search the world for price and performance, we arrive just in time.

We're Foundry Networks. And we've got powers no one else can match. For starters, we're the only vendor to offer super-fast 10/100 and Gigabit Ethernet switches for Layers 2, 3, and 4-7—all totally integrated. Plus Packet Over SONET WAN links. That's product breadth from the network edge to its core.

Then there's our super feature set. Integrated multi-protocol wire-speed routing and application-aware Layer 4-7 switching. Plus 64 port Gigabit Ethernet density at up to 96 Mpps for maximum investment protection and flexibility.

Yes, we've won multiple awards for product and corporate excellence, but we're not in this business for the praise. We're in it to give our customers **IronClad Network Performance**. Does that make us super-heroes? We don't know. But our customers might.

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THIS WEEK ONLINE

Help Desk. A user is planning an installation of an Oracle-based accounting system on NT. To maintain uptime, should he use Microsoft Clustering or Windows Load Balancing — or a third-party system? See what Help Desk Editor Ron Nutter recommends. If you have a different suggestion, jump into our forum and let us know.
DocFinder: 4739

Quo vadis? At NetWorld+Interop '99 Atlanta last week, the main topic of conversation, at least for East Coast attendees, seemed to be whether they'd get home in the face of Hurricane Floyd. But also last week, several *Network World* columnists made predictions for the future of networking in a "crystal ball" session. See what they said.
DocFinder: 4740

Remember Rte. 128? Last week, Features Editor Neal Weinberg described the end of the fabled Rte. 128 high-tech industry. Readers reacted. One said that when a high-tech company makes a technology decision may be even more important than what it decides. Join the discussion.
DocFinder: 4741

Encryption. The government last week eased restrictions on the export of tough-to-break encryption technology. Good or bad? Or is it irrelevant given the development of high-quality encryption software outside the U.S.? Read our story, then join a forum to discuss it.
DocFinder: 4742

Vendor info. Want to bone up on a network vendor? We've assembled pages on scores of them. You'll find links to vendors' financial and stock information, their site search engines and an archive of recent *Network World* articles about them.
DocFinder: 4743

How to get onto Network World Fusion

Click on Register on the home page and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Nonsubscribers must fill out an online registration form.

NetworkWorld

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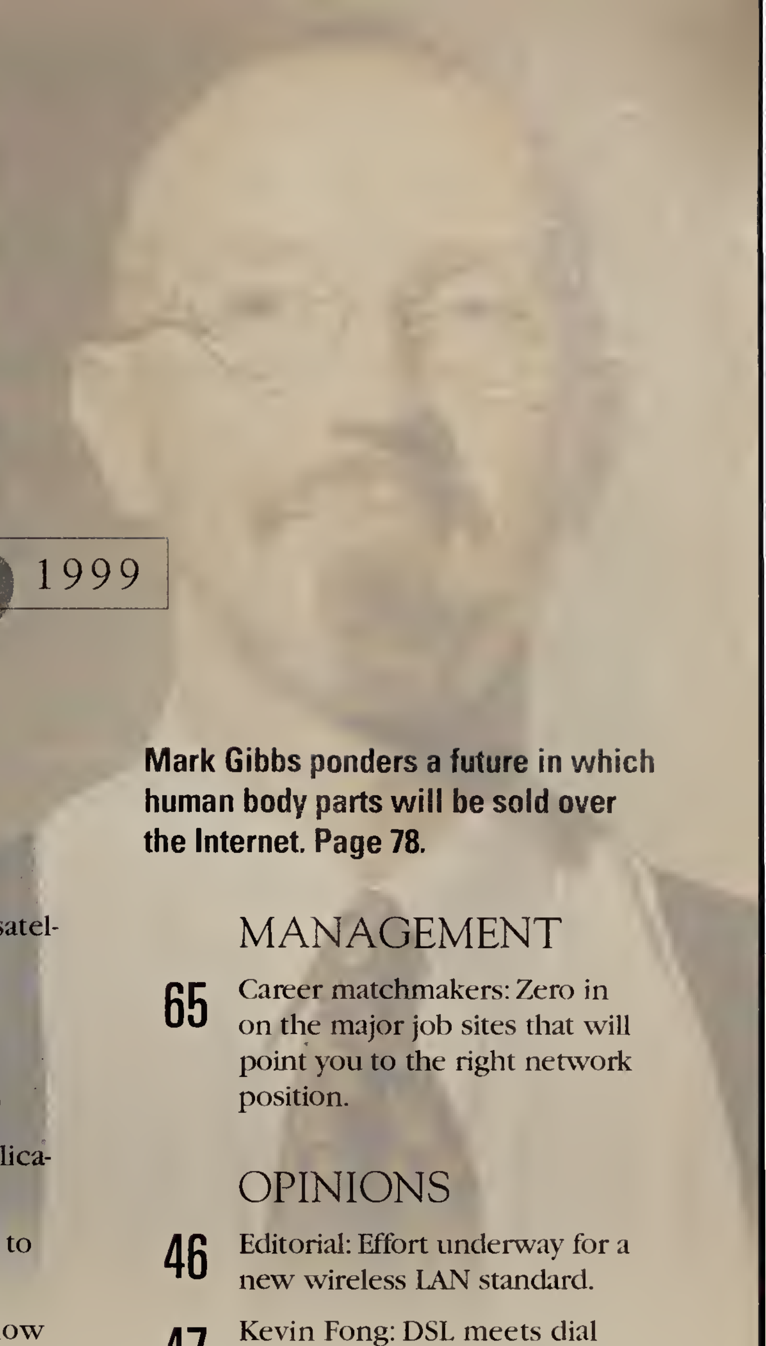

Mark Gibbs ponders a future in which human body parts will be sold over the Internet. Page 78.

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IBM's acquisition strategy: Shop (quietly) till you drop. Page 25.

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HOW TO CONTACT US

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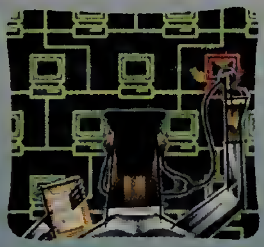
FEATURES



NETWORK FIRE PREVENTION

Do you spend too much time putting out network fires? There are tools out there that can alert you to potential problems so you can fix them before your end users are affected. PAGE 49.

The Internet has come a long way in 30 years. Find out what the Internet's pioneers think the next 30 years will bring. PAGE 55.

See how Mirage Resorts connects its casinos. PAGE 57.

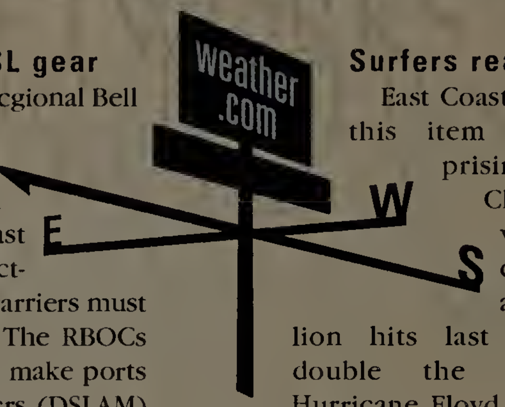
REVIEW:

Mercantec's SoftCart e-commerce site-building tool ranked best overall, though Intershop Communications' Intershop was tops for performance. Page 59.

COOL TOOLS: WebPosition Gold and TopDog can boost the search engine rankings of your Web pages. Page 62.

VAL MINA

NEWS BRIEFS, SEPTEMBER 20, 1999



FCC unshackles Bells' DSL gear

In a clear attempt to get the regional Bell operating companies to speed up their digital subscriber line (DSL) rollouts, the Federal Communications Commission last week narrowed the list of network gear that dominant local carriers must make available to competitors. The RBOCs and GTE will no longer have to make ports on their DSL access multiplexers (DSLAM) and packet data switches available to local competitors, except in certain limited circumstances. The RBOCs have been arguing that letting other carriers piggyback on this equipment only discourages the Bells from rolling DSL out in more areas.

But the FCC's move was not the more complete deregulation of RBOC data services that GTE in particular has been demanding. DSL competitors that have their own DSLAMs, and other data-carrier specialists with local frame/ATM switches, will still have collocation and interconnection rights in RBOC central offices. And there's no change in the FCC's local-loop regulations. RBOCs will still have to offer competitors that last mile to business and residential customers.

Software maker Visio draws $1.3 billion from Microsoft

Microsoft last week acquired Visio, which develops business diagramming and technical drawing software, in a $1.3 billion stock transaction. Visio has a number of Windows-based drawing products, including the recently released Visio 2000, all of which feature a drag-and-drop interface for creating drawings from business flow charts to network designs and electrical engineering. Microsoft intends to keep Visio a separate product but partner it with Microsoft's Office suite as part of a line of knowledge management offerings.

Gates and wife share the wealth through charity.

Gates lends students a $1 billion hand

Bill Gates, whose net worth hovers around $90 billion — give or take a stock market belch or two — continues to deliver on his promise to give away a good deal of his fortune. Last week, he and wife Melinda pledged $1 billion over 20 years to fund scholarships for minority students. The United Negro College Fund is administering the program with support from the Hispanic Scholarship Fund and American Indian College Fund. The Gates Millennium scholarship will provide assistance to 1,000 students each year.

Surfers really rode Floyd

East Coast readers will find this item less than surprising: The Weather Channel's Web site, www.weather.com, reported a record 23.5 million hits last Tuesday, nearly double the previous high. Hurricane Floyd was to blame, of course, just as another storm, Hurricane Georges, was responsible for the previous high last year. "These record numbers reflect consumers' growing reliance on the Web to access up-to-the-minute weather information," notes a Weather Channel press release. . . . At least until the lights go out.

Inktomi snaps up WebSpective

Inktomi last week reported it had agreed to buy WebSpective Software, a maker of software used to distribute and track Internet content. The stock deal was valued at $106 million. Inktomi, a provider of 'Net search software and other products used to speed Web site performance, said the acquisition will let Inktomi offer better content management services to the Web-hosting market. WebSpective products will also allow Inktomi to begin serving corporate customers directly by year-end, the company said.

Hackers 'borrow' Web sites

A hacker group calling itself the United Loan Gunman struck several Web sites last week, managing to briefly replace Web pages with its own graffiti. The public Web servers the group broke into included the Nasdaq-Amex information site, as well as news sites including those of ABC, C-SPAN and gossip columnist Matt Drudge.

WebSide Story releases a sequel

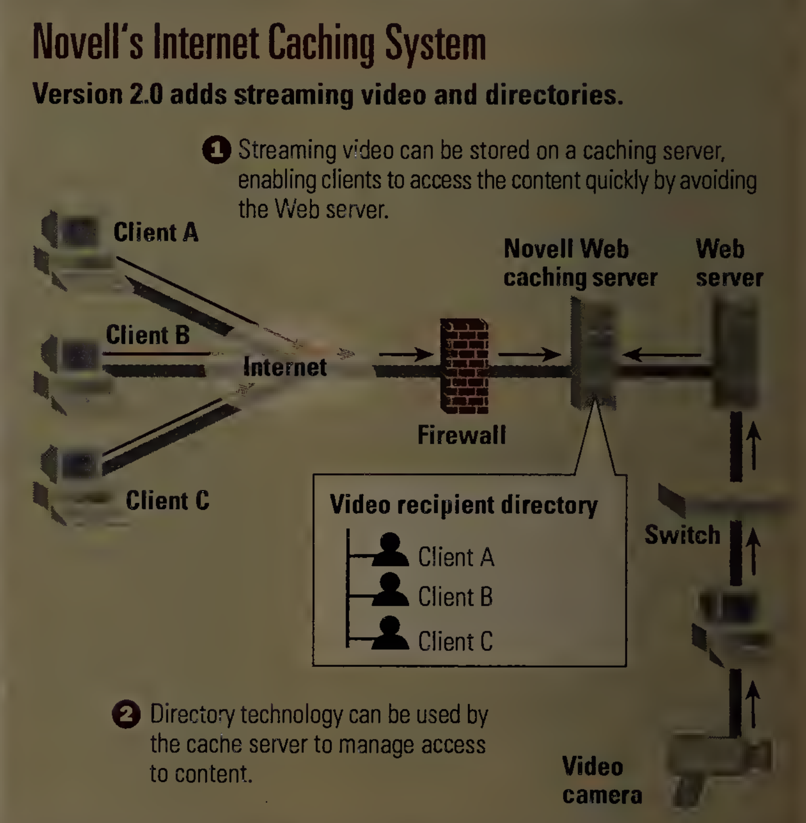
WebSide Story, the application service provider that tracks Web page hits through its HitBox, is now providing in-depth analysis both through online and human-based research. Beginning this week, the company will offer a new service, dubbed StatMarket eData Mining, for performing real-time Web traffic analysis. Customers will be able to compare their site's traffic to industry and global Web trends, based on data the company has collected from some 350,000 HitBox-tracked sites. The company anonymously tracks individual click streams to help companies determine where their users come from and where they have been previously. The service costs roughly $1,500 per month based on the amount of site traffic.

Novell adds flash to caching server

Version 2.0 of Internet Caching System to support video streaming and directory management.

BY DENI CONNOR

ATLANTA — Novell officials last week revealed that the second edition of the company's caching server software will take advantage of directory services technologies and feature support for bandwidth-intensive multimedia streaming.



Novell's Internet Caching System

Version 2.0 adds streaming video and directories.

❶ Streaming video can be stored on a caching server, enabling clients to access the content quickly by avoiding the Web server.

❷ Directory technology can be used by the cache server to manage access to content.

With Version 2.0 of its Internet Caching System (ICS) scheduled to ship early next year, Novell is looking to build on the early success of its original platform-independent Web caching server. The first edition of the software is already being bundled with servers from companies such as Dell and Compaq. Novell said last week at NetWorld+Interop '99 Atlanta that IBM will ship ICS on its Netfinity servers.

ICS, which has been around since March, caches frequently used Web content so end users can retrieve that content more quickly and efficiently (see graphic). The software can be configured to speed access to public or private Web servers. In a caching bake-off sponsored by the National Laboratory for Applied Network last March, Novell's ICS installed on Dell hardware finished second to Inktomi's Traffic Server by handling up to 1,500 requests per second with a mean response time of 1.4 to 1.7 seconds.

While it might be surprising that the initial version of ICS didn't support Novell

See **Novell**, page 75

Be a

Net Know-It-All

For the answer to this week's question and more net trivia, visit Network World Fusion and enter 2467 in the DocFinder box.

This week's question:

Where did load-balancing product vendor F5 Networks get its name from?

www.nwfusion.com

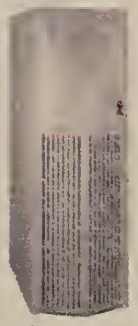
You'll never guess what we were doing when we came up with the idea for our new server.

Actually, we were thinking of ways to help our clients reduce their total cost of operations. And it occurred to us that consolidating complicated IT environments would be a good place to start. Which, naturally, led to the development of the new Unisys Aquanta™ ES 5000 line of midrange servers based on the equally new Intel® Pentium® III Xeon™ processor. These robust servers help you handle workloads on multiple partitions, while maintaining single-image operations and management. And they improve availability by providing a fully recoverable environment for your applications, databases and transactions. For more points on our new servers, check out our Web site. Meanwhile, we'll be working on our, well, you know.

www.marketplace.unisys.com/ent/

intel inside

pentium® III xeon™



Aquanta ES 5000

UNISYS We eat, sleep and drink this stuff.

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Network chip makers unite

BY JEFF CARUSO

ATLANTA — In a few years, network gear will be built a lot differently than it is today, according to silicon manufacturers at NetWorld+Interop '99 Atlanta last week. The result for customers could be equipment that is easier to upgrade and lasts longer.

Instead of using custom silicon to move packets at wire speed, switch makers will be able to speed traffic along via a combination of software and network processors. Plus, with standard interfaces between network equipment components on the way, switch vendors will be able to include software and silicon from different suppliers in their switches.

A group of five companies led by IBM and C-Port was formed last week with the intent of creating standard programming interfaces for this emerging class of network processors. Called the Common Programming Interface (CPIX) Forum, the group plans to meet next month to determine the software areas on which it should focus.

Intel's Christensen says network processors will enable a new class of net services.

The organization will work with the similarly named Common Switch Interface (CSIX) Consortium, which is defining interfaces at the hardware level between switching fabrics and communications processors. CSIX is finishing its draft specification and hopes to demonstrate interoperability among different vendors' components by October 2000.

The new architecture will first benefit equipment vendors, which will be able to assemble their switches from components obtained from different suppliers.

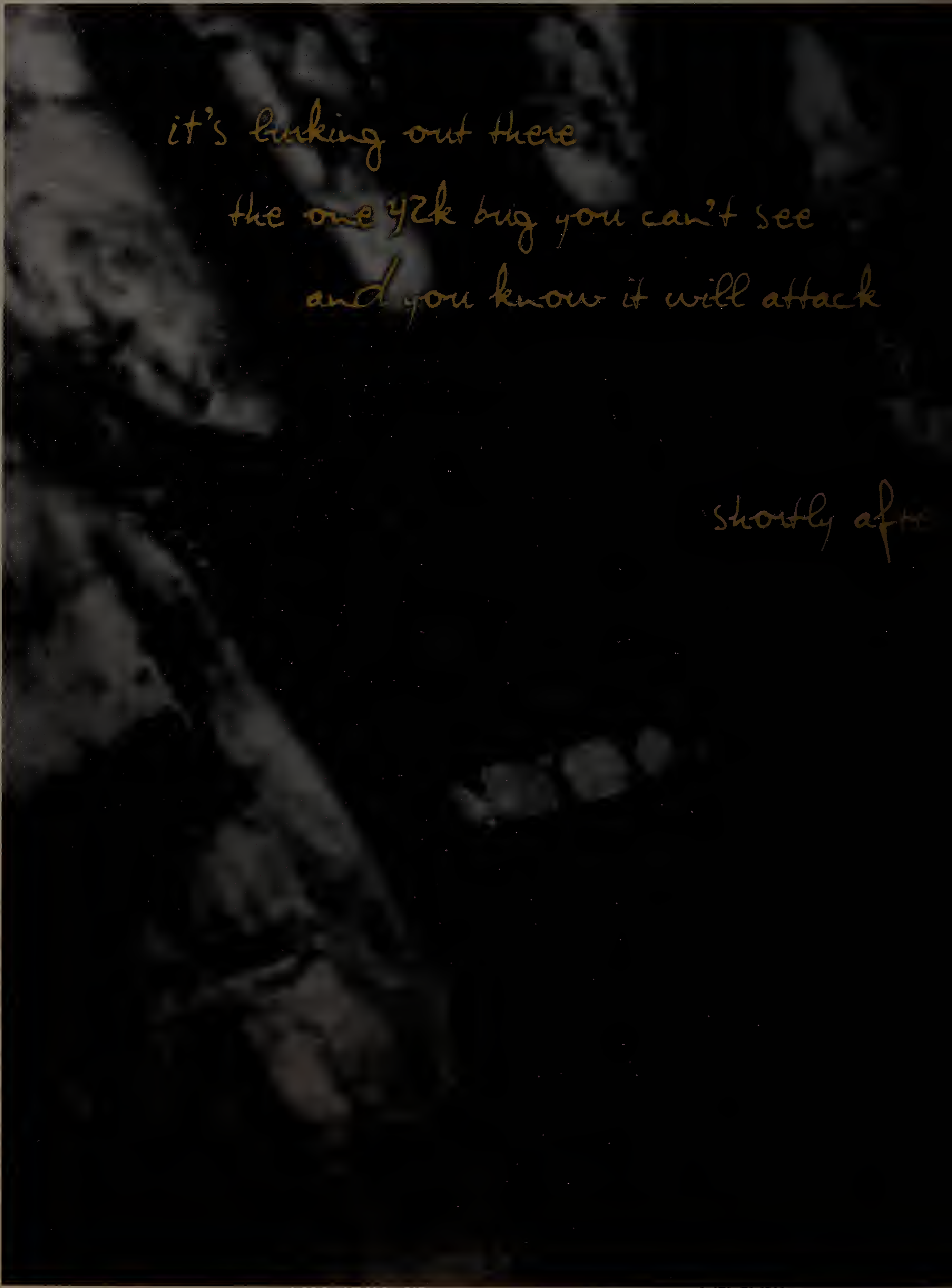
Users will also profit. Although Application Specific Integrated Circuits deliver speed, they aren't flexible. With the new architecture, users will be able to add features, such as quality of service (QoS) or security, to switches as they become available, just by downloading software.

This ability means that users will be able to keep their equipment longer, says Clint Ramsay, vice president of marketing at C-Port, a start-up that makes communications processors.

Mark Christensen, vice president and general manager of Intel's network communications group, touted the benefits of network processors in his Interop keynote address. "We have to be ready for the applications of the future, even if we don't know what those applications are," he said. Equipment makers could write services, such as security and QoS guarantees, as software to run on network processors, Christensen said. "Silicon enables the new class of services that the Internet community is going to demand," he said.

In addition to IBM and C-Port, the CPIX Forum's initial members include: Inverness Systems, a network software supplier; SiTera, another network processor maker; and SwitchOn Networks, which makes packet classification coprocessors.

The CSIX Consortium has 20 members, including Broadcom, C-Port, IBM, Maker Communications, Power X and XaQti. ◪


it's lurking out there
the one y2k bug you can't see
and you know it will attack
shortly af

Voice over IP still has hurdles to clear

BY DENISE PAPPALARDO

The glitz of the Voice and Video over IP Convergence Pavilion at NetWorld+Interop '99 Atlanta last week belies the truth: Business users are not yet using voice-over-IP services.

"Voice over IP isn't an option for our organization right now," says Timothy Mixon, LAN administrator for the University of Georgia. In order for the university to move its infrastructure to voice over IP, the technology will need to be more mature and easier to use, he says.

Those sentiments aside, vendors demonstrated products aimed at business users at the pavilion, which was sponsored by RadVision, ACT Networks, Cisco and Polycom. For example, users could find Alcatel showing off its X600 Gateway, which supports voice, fax and data traffic; Vcon demonstrating its video-over-IP conferencing products; and ACT Networks showing its Service Xchange SX-10 voice gateway.

The goal of the pavilion was to "show the market has moved beyond enabling technology to actual commercial deployment for both carriers and enterprise users," says Michelle Blank, vice president of global marketing at RadVision.

But while the demonstration of new products, technologies and interoperability among multiple vendors is positive, the technology hasn't really caught on yet, experts say.

Business users, at best, are only dabbling in voice over IP, says Mark Winther, group vice president at International Data Corp.'s worldwide telecommunications group. This year, of the 2.08 billion voice minutes that IDC is predicting will travel over IP networks, only 330 million minutes will come from business users. In fact, Winther says business use of voice over IP will not surpass consumer use until 2004.

There are a number of things that need to take place before business users will start adopting voice-over-IP services, Winther says. Today, in order to use some of the free Internet voice services, users have to dial 16 or 20 digits before they actually reach their party, Winther explains. Business users need the same features they currently have on their desk before they will adopt voice over IP, he says.

Starting in 2001, service providers are expected to have native mode IP products in hand from companies such as Lucent, Clarent and VocalTec. Native mode IP will let business users connect IP-enabled PBX switches or fax machines to an IP network and use them as if they were connected to the public switched telephone network. Business users have shown that even though voice over IP today may save money, that's not the only driving factor, Winther says.

When service providers can offer business users a virtual private network service that includes high-quality voice, data and faxing capabilities over one connection, then they will start to seriously consider voice over IP, Winther says.

Network World Fusion Managing Editor Sandra Gittlen contributed to this story.

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Hosted apps market to put pressure on Microsoft pricing

BY JOHN FONTANA

REDMOND, WASH. — Microsoft may appear poised to storm the applications hosting market, but the company actually has quite a few issues to sort out before it bulls ahead.

The most important and toughest of those issues is coming up with a hosted applications licensing structure that will be attractive to application service providers (ASP) and customers but that won't wipe out Microsoft's current lucrative software licensing model.

When asked at a developers event in San Francisco last week how Microsoft would make money as software shifted off the desktop, company President Steve Ballmer candidly responded: "Don't know yet."

But he does know that Microsoft's current licensing model is a cash cow the company has no intention of slaughtering. The model requires users to pay for a Client Access License (CAL) for each end user as well as a server license fee.

For instance, the price to license BackOffice 4.5 is about $3,100, which includes five CALs. An additional five CALs cost roughly $1,300.

"We want to figure out how to work with ASPs and not cannibalize our revenue," a company spokesman says. "We are looking at what makes sense."

Microsoft officials say they hope to establish a hosted applications licensing model within the next six months.

Ballmer says he's not sure how Microsoft will adapt to the new apps market.

While Microsoft's indecision may be getting in the way of ASPs' business plans, the software company isn't standing still.

Last week, for instance, Microsoft made generally available to ASPs its Complete Commerce program, a hosted Windows NT platform for commerce applications. In April, Microsoft began a pilot program for hosting BackOffice, and it already has a number of partnerships with the likes of Dell, Qwest and Qualcomm in the hosted applications area.

But industry observers say Microsoft is still moving too slowly.

"I don't think Microsoft gets it," says Jane Giera, an analyst with Giga Information Group. "Eventually the Microsoft castle will have to crumble. Microsoft can dismantle its own licensing model and control the chaos, or have it done for them by the market."

In the hosted world in which users anticipate low-cost or no-cost applications, such as free e-mail, Microsoft must figure out how to collect similar amounts of money for its software whether it is paid upfront, as it is under the current model, or by subscription.

"On the monetary side, there are complex issues," says Dwight Davis, an analyst with Summit Strategies. "Those issues are keeping a lot of folks at Microsoft up late at night."

Davis doubts Microsoft will be able to maintain current revenue levels.

Microsoft does have a commercial licensing program underway. The company is using a pilot for hosted BackOffice to test various licensing models and explore how its channel partners fit into the puzzle.

FutureLink, an ASP in the BackOffice pilot program, simply pays a server license and a monthly access fee based on the number of users, according to Tony Hill, product manager for FutureLink. Data network giant Equant, which last week unveiled an ASP partnership with Microsoft and a hosted Exchange messaging service, says it does the same.

"We do that because we're still hammering out the arrangements on a final licensing model," says Laurence Huntley, an Equant executive.

But radical changes may not be forthcoming for enterprise customers.

"Our enterprise clients have asked if hosting will lower their licensing costs, and Microsoft has said no," says John Kretz, president of Enlightened Point Consulting Group. "Microsoft says the change is in delivery of software, not its cost."

Microsoft says management and administrative savings for enterprises will exist, however, when infrastructure is hosted by an ASP. ◪

Microsoft's ASP manifesto

Microsoft is developing hosting models and strategies in four key areas of service:

Knowledge management
- Catalogs (data analysis and search).
- Communication.
- Desktop productivity.
- Collaboration.

Commerce
- Direct selling.
- Corporate purchasing.
- Supply chain.

Media streaming
- Live events.
- News and entertainment.
- Corporate communications.

Managed applications
- IT application services.
- Business application services.
- IP applications.

More breaking news

Network World Fusion now has more news than ever. Check out these stories online:

N+I: Spectrum puts new name on ice

Cabletron's Spectrum group was looking for a new name. It came up with Netuitive and hoped to announce the name last week at Interop. Unfortunately, another company trademarked the name two days before Cabletron tried to do the same.
DocFinder: 4746

Army dumps NT, citing security; Internet Explorer flaw reported

Recently, a 19-year-old hacker from a group called Global Hell broke into an Army Windows NT-based Web server. The reaction was fast and sure. Out goes NT, and in comes the Mac.
DocFinder: 4745

Another Hotmail hole?

Microsoft thought it had fixed its Hotmail security problems, but a programmer in Bulgaria just found another . . . this time with JavaScript. Microsoft's answer? Turn JavaScript off.
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Redundancy was the word for VPN vendors at N+I

BY TIM GREENE

ATLANTA — Virtual private network vendors understand that if they want people to rely on their gear, it has to be reliable.

To that end, a number of VPN vendors last week at NetWorld+Interop '99 Atlanta introduced VPN failover, technology that keeps secure Internet connections alive even when the primary VPN server fails.

Nokia, TimeStep, Microsoft, Indus River and Compatible Systems all introduced hardware or software with the ability to share security information, including encryption keys, with another server. All claim their servers switch over within seconds of a failure, most without losing sessions.

Nokia is introducing software that lets its servers not only failover, but also load balance. If there is a crush to establish secure Internet tunnels on a corporate VPN at 9 a.m., for example, multiple Nokia VPN servers can share the load.

Nokia calls the technology High Availability VPN, and it is a software option on its VPN 210 and 220 servers for an additional $1,500. The software is standard on the company's VPN 230 and 240 servers.

Also, if there is a network slowdown, the devices can route around the bottleneck. A corporation with redundant Internet connections could tie different Nokia VPN servers to each Internet link. If one link slows down for some reason, traffic would be shifted to the uncongested link. Nokia's new software is available now.

TimeStep says it is working on the ability for servers to load balance. TimeStep's new software is available next month for its Permit Gateways.

Microsoft demonstrated that Windows 2000 servers can load balance VPN sessions and failover to back each other up. However, the servers will drop active sessions. The Windows 2000 client or server with which the tunnels had been established will initiate new tunnels with alternate servers.

Meanwhile, Indus River introduced a new VPN server, RiverWorks LXE 6000, which supports 5,000 simultaneous VPN connections. RiverWorks LXE 6000 is sold packaged with River Pilot client software for $100 to $200 per client, depending on the complexity of the network.

A new issue of RiverWorks software also lets RiverWorks boxes talk to each other via Internet tunnels. Previously, only remote clients could establish VPN sessions with the servers.

Compatible announced it will beef up its carrier-grade VPN gear to support more sophisticated VPN services. For instance, service providers will be able to support firewalling, as well as quality-of-service guarantees. Its IntraPort Carrier Switch gear will also support encryption over frame relay and ATM links to ISP networks.

The new features will be phased in over six months starting in December.

Nokia: www.nokia.com; TimeStep: www.timestep.com; Microsoft: www.microsoft.com; Indus River: www.indusriver.com; Compatible: www.compatible.com

On cost-effective network management, Kendall-Jackson makes a case for NetSolve.

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The critics agree:
"Indeed, META Group anticipates that by 2001 all but the largest IT shops will rely on outside help for delivering at least a portion of their network services, with network management becoming a strong candidate for outsourcing."
Mark Bouchard
META Group

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3Com, Nortel bolster switch families

BY JIM DUFFY

ATLANTA — Users should clear the decks for some new switching gear from 3Com and Nortel Networks that was quietly demonstrated or discussed at last week's NetWorld+Interop '99 Atlanta.

In the 3Com booth, the company was demonstrating an unannounced eight-slot version of its CoreBuilder 9000 switch for enterprise data centers.

3Com was also showing an embedded Windows NT module for the switch and a new eight-port gigabit copper SuperStack switch in the Gigabit Ethernet Alliance booth.

Rival Nortel booked a hotel suite to show its Accelar 8600 Layer 3 network core switch to customers willing to sign nondisclosure agreements. But Accelar product managers in the Nortel booth were forthcoming with information on the 8600, including plans to roll out Layer 3 10/100 and Gigabit Ethernet modules in November and some ATM and packet-over-SONET blades next April.

The demonstrations show that some of the leading LAN switch vendors are ready to deliver on promises made when they announced their core offerings six to 18 months ago.

The events also indicate that demand for the latest LAN switching technology remains healthy among large enterprise network customers despite year 2000 concerns and vendors' emphasis on sales to service providers and small and midsize businesses.

3Com's eight-slot CoreBuilder 9000 is the third iteration of the high-end switch. 3Com already offers 16-slot and seven-slot variations for high-density core and chassis-based wiring closet applications, respectively.

The eight-slot switch features greater redundancy than the seven-slot CoreBuilder 9000 but half the port density of the 16-slot version. All switching modules are interchangeable between the seven-, eight- and 16-slot configurations of the CoreBuilder 9000, 3Com product managers say.

The switch was running a 24G bit/sec switch fabric that 3Com plans to scale to 112G bit/sec, product managers say. And tucked into the switch was a new Layer 3 Gigabit Ethernet module based on 3Com's FIRE Application Specific Integrated Circuit, which sports four gigabit interface converter ports for connectivity to server farms or other switches.

In addition to enterprise net backbones, the switch is designed for service providers offering voice-over-IP, Web hosting or other data services requiring traffic classification and priority policies.

Underneath the eight-slot CoreBuilder 9000 in the 3Com booth was a 16-slot version of the switch running an embedded Windows NT module. The module is designed to add intelligence to the CoreBuilder 9000 switches by tightly linking frame-forwarding decisions to NT-based policies, directories, firewalls and other network service applications running on the embedded operating system module.

3Com announced plans to support embedded NT on its switches early this year.

More where that came from

Over in the Gigabit Ethernet Alliance booth, 3Com was showing an unannounced SuperStack gigabit copper switch for server farm and workgroup aggregation. The switch features six 100/1000-TX ports and two 1000Base-SX ports with RJ-45 and MTRJ jacks.

3Com was also showing a copper-based Gigabit Ethernet network interface card with a single RJ-45 1000Base-T jack.

By supporting copper wiring, the products are designed to lower the cost of implementing Gigabit Ethernet in enterprise networks.

"This makes sense for 3Com's customer base," says Esmeralda Silva, an analyst at International Data Corp. in Framingham, Mass. "If customers have close wiring closets with existing [copper] wiring, why not use that instead of pulling new fiber?"

The new 3Com products are expected to ship by November. 3Com product managers did not disclose pricing.

Nortel's plans

November is also when Nortel plans to ship the Accelar 8600, the Layer 3 version of the Accelar 8000 data center switch announced in April.

Included in the launch will be eight-port fiber-based Gigabit Ethernet modules, 48-port 10/100M bit/sec Ethernet cards and 48-port fiber-based Fast Ethernet boards, Nortel product managers say.

These will bring the Accelar 8000's Gigabit Ethernet port density up to 64 and its performance to 100 million packet/sec.

In April 2000, Nortel will expand the WAN and ATM-based features of the Accelar 8000 with six-port OC-3 and three-port OC-12 packet-over-SONET interfaces, and eight-port OC-3, two-port OC-12 and four-port DS-3 ATM interfaces for the switch.

The ATM interfaces are also designed to help migrate users of Nortel's Centillion ATM switches to the Accelar Gigabit Ethernet switches, product managers say.

"It makes sense to have ATM support. It's really important to have that tie-in between cell and frame switching, like Cisco's Catalyst 8500," Silva says.

Switch futures

New gear is on the way from 3Com . . .

- 8-slot, 24G to 112G bit/sec CoreBuilder 9000
- Embedded Windows NT module
- 8-port, copper-based gigabit SuperStack switch

. . . and Nortel

- Accelar 8600, with eight-port gigabit and 48-port 10/100 Layer 3 switching modules
- OC-3, OC-12 and DS-3 ATM and packet-over-SONET interfaces

New chips power Extreme switch

BY JEFF CARUSO

ATLANTA — Extreme Networks is infusing its upcoming switches with a new generation of chips that is more powerful, takes up less space and has more features than the current line.

The company unveiled the first switch based on the chips at last week's NetWorld+Interop '99 Atlanta. Called the Summit7i, the switch is designed for connecting servers to a network at high speeds. The Summit7i has 32 Gigabit Ethernet ports in a fixed configuration.

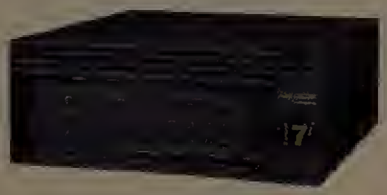
The new chips — called the Summit iSeries and previously code-named Inferno — execute several functions in hardware that current Extreme gear doesn't.

The capabilities include server load balancing, IPX wire-speed routing and support for Jumbo Frames.

"Those kinds of functions are requisite for intelligent networking in the data center," says Ron Westfall, senior analyst at the Current Analysis consultancy.

The chips have a variety of functions built into them, and users can buy software to turn on any of the functions.

The Summit7i can move 48 million packet/sec. But with multiple chips, the architecture can scale up to 768 million packet/sec, says George Prodan, Extreme's vice president of marketing.



Extreme's Summit7i connects servers to a network at high speeds.

The chips' load-balancing capability lets servers connected to an Extreme switch share a common IP address. Workloads can be distributed among the servers.

The IPX routing in hardware is also new for Extreme. Previously, only IP routing was supported at wire speed.

The Jumbo Frames support is something the company threw into the chipset just in case some users want it, Prodan says. By using frames larger than what the standard allows, servers can send large files to one another more quickly.

The new chipset provides four times the bandwidth of Extreme's previous chipset.

The new switch comes in copper and fiber-optic models. The copper version has 28 copper ports and four fiber-optic ports, while the fiber version has four standard fiber ports and 28 small MT-RJ ports.

The product supports the same number of Gigabit Ethernet ports as Extreme's chassis-based, high-end BlackDiamond switch.

But the new switch has a fixed configuration and a 7-inch height in order to appeal to service providers trying to squeeze a lot of equipment into small spaces, Prodan says. The BlackDiamond will get modules based on the new chip technology in coming months.

The Summit7i ships in November. The copper version starts at $20,000, and the fiber version starts at $29,000.

Extreme: www.extremenetworks.com

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MCI WorldCom slates frame relay improvements

BY DAVID ROHDE

ATLANTA — MCI WorldCom says it has found something close to the root cause of its recent frame relay failure, and the company is now offering penance — such as service price reductions — to appease its customers.

In briefings at NetWorld+Interop '99 Atlanta, MCI WorldCom also confirmed that it has scuttled a plan to move legacy MCI frame relay customers to an upgraded version of the legacy WorldCom network based on Lucent switches.

Instead, the company will consider running the two networks in parallel and offer new users one as a backup to the other via enhanced network-to-network interconnections.

Alternatively, MCI WorldCom may establish a brand new parallel frame relay "shadow network" or, long-term, simply consider its vast IP network as the unified global network of the future.

Fred Briggs, MCI WorldCom vice president for technology and engineering, says the net failure in August occurred because new Lucent software loaded on switches in the legacy WorldCom network failed to synchronize with two other elements: a network-management database holding information about customers' circuits and the previous switching software load in switches that had yet to be upgraded.

The problem occurred about one-third of the way through a long-term process of upgrading the Lucent switches to accommodate the higher capacity expected for new and migrating legacy MCI customers, Briggs says. The upgrades had begun in Lucent switches in June after an eight-month lab-testing period.

That explains why MCI WorldCom made what later became the highly controversial decision not to back out of using the new software when the problems began, Briggs says.

Since 30% of the network had already been upgraded — and the performance of that 30% was better in terms of CPU utilization than it was with the old software — MCI WorldCom decided to forge ahead after temporarily stabilizing the network during the first affected weekend.

Only after excessive CPU utilization resulted again from administrative messages — bringing down virtual circuits — did MCI WorldCom decide to pull the plug before the second weekend of the incident.

Taking responsibility

Briggs, declining an opportunity to blame Lucent for these problems, says he and his staff take full responsibility — first for leaving the new software load in the switches while trying to stabilize the network and then days later doing an about-face and pulling the software out.

Jim DeMerlis, the carrier's vice president of enterprise data product marketing, says it was up to MCI WorldCom to "make amends to our customers for what we put them through."

Acknowledging that the company did a poor job of updating users during the outage, DeMerlis says MCI WorldCom is looking at ways to better equip account teams with accurate updates.

He says MCI WorldCom's customer service department only sent out notifications of network problems to a subset of the affected users, and that account representatives often could only go through the customer service department to try to find out what was going on.

MCI WorldCom is also now running a 60-day promotion on frame relay ports. Users can get 128K bit/sec ports for the price of 64K ports, 256K ports for the price of 128K, and so on up the line to T-1.

In other moves, MCI WorldCom is considering toughening the financial penalties on its frame relay service-level agreements, examining new dial backup options, and launching a 30-day money-back guarantee on its Circuit View frame relay enhanced service.

Circuit View employs intelligent DSUs on customer premises to collect network-performance data into a Web-accessible database. ◪

Reporter's Notebook

SEEN AND HEARD AT N+I

Greenspan a techie?

Lucent's McGinn

Lucent CEO Richard McGinn, who does the keynote thing better than most head honchos, told Tuesday's opening assembly that he was pleasantly surprised recently when he heard Federal Reserve Board Chairman Alan Greenspan utter the phrase "wave division multiplexing" in a speech. "I knew these technologies were moving into the mainstream when I heard the chairman of the fed talking about them," McGinn said.

He's got that right. What remains a mystery, however, is what wave division multiplexing has to do with long-term interest rates.

Beat up Cisco day

Network World's Convergence Showdown produced a number of "Let's beat up on Cisco" moments, including a poke from Nortel Networks executive T.J. Fitzpatrick regarding Cisco's much-ballyhooed commitment to rely on IP telephony within its corporate campuses. "We'll keep making PBXs as long as Cisco will buy them," Fitzpatrick quipped.

Marthin De Beer, Cisco director of enterprise convergence strategy, countered that his company is no longer renewing leases on internal PBXs . . . but judges had already awarded the round to Fitzpatrick.

Nortel's Fitzpatrick took on Cisco

PHOTOS: ALAN WEINER

Floyd spoils the party

Attendance seemed light at the show. The exhibit hall in the east wing of the Georgia World Congress Center was especially slow. Observers blamed the glut of network trade shows and conferences — N+I has several such events, sometimes concurrently, in North America and Europe — a slowdown in user buying due to Y2K concerns, and Hurricane Floyd. The hurricane also stranded a number of showgoers in the Atlanta area for a few extra days.

Slogans 'R' Us

Catching a potential customer's attention the old-fashioned way — with a clever slogan — would seem to be a lost art at these megatrade shows where vendors spare no expense and exhibit no shame in outdoing one another with gimmicks.

But there were a couple of slogans worth noting. From SBE, maker of PacketEYES, a policy-based network management product: "Big Brother Would Be Proud." And this one from Concord Communications, a developer of Web-based network monitoring tools: "Arrive an IT manager. Leave a minor deity."

—Paul McNamara and Jim Duffy

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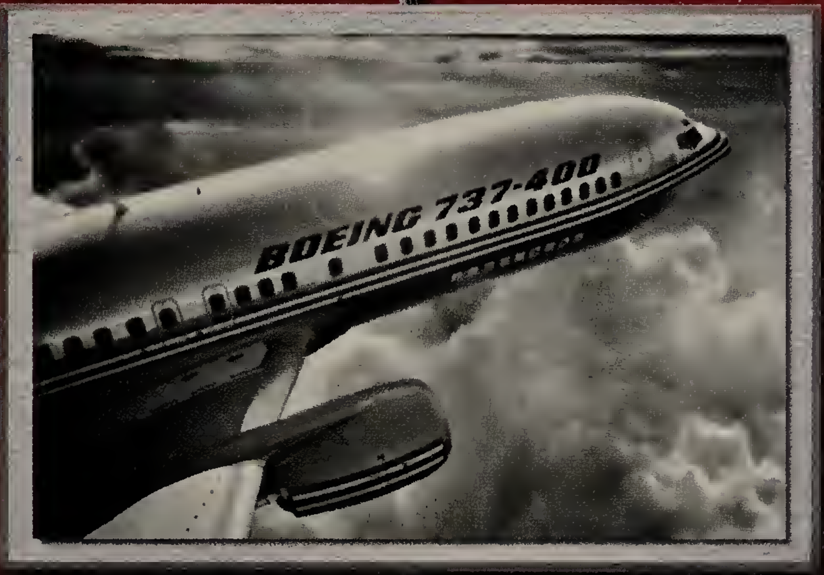

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AT&T touts expanded Internet access options

BY DENISE PAPPALARDO

ATLANTA — AT&T is offering business users more choices when it comes to accessing the Internet, from nationwide DSL to broadband wireless services. And these services may soon extend beyond Internet access.

Last week at NetWorld+Interop '99 Atlanta, AT&T announced its Broadband Business Services (BBS), which will include digital subscriber line (DSL), cable modem and wireless Internet access for corporate customers. In addition to providing faster Internet access, the offerings will also speed access to corporate intranets, extranets and virtual private networks.

"These offerings are very important because they can form the foundation for DSL and cable modem services to become wider access vehicles for additional services," says Christine Heckart, vice president at TeleChoice, a Boston consulting firm.

Instead of dealing with numerous local providers, business customers using BBS will be able to work with one service provider and receive one bill for DSL, cable modem or wireless services that link all their remote offices to one corporate network.

Easing access to corporate networks fits in with the Integrated Network Connect (INC) service AT&T announced in January. AT&T officials said then that by year-end, INC would support Internet, frame relay and voice on the same access lines. Initially, INC only supported private-line access, but access options such as DSL were expected.

STEVE BORNS

AT&T's Early wants high-speed 'Net on-ramps for users.

"AT&T is moving from narrowband to broadband access to ensure that all users' on-ramps are high-speed," says Kathleen Early, president of Internet services at AT&T.

AT&T's DSL service is now available in 17 markets, with more than 100 coming online by the end of next year. AT&T is teaming with Covad Communications, Rhythms NetConnections and AT&T's own local service division to provision its nationwide DSL offering.

AT&T's DSL service comes in Multi-User and Managed Multi-User service options, which let users in a small or midsize office use one 144K bit/sec to 1M bit/sec DSL line to access the Internet. The service costs $149 to $469 per month. AT&T's managed version includes management and monitoring of a customer's DSL router and costs an additional $50 per month. A single-user version is slated for availability next month.

For those looking for up to 10M bit/sec cable modem Internet access, AT&T is launching a trial service next month in Chicago, Dallas, Denver, Portland, Ore., San Francisco and Seattle. The trial is expected to last until mid-2000. ◪

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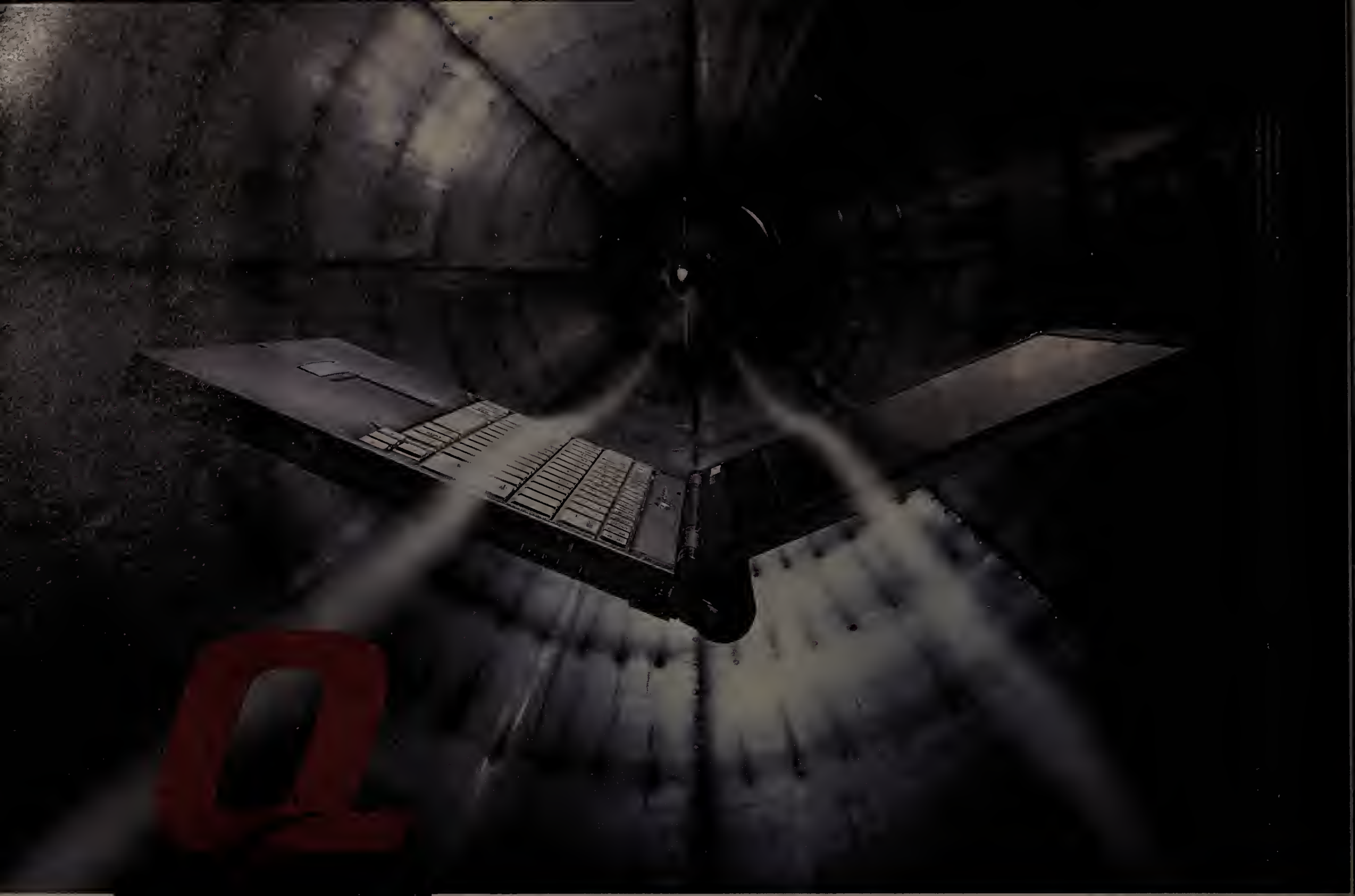Streamlined?

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Briefs

Advanced Digital Information Corp. (ADIC) last week rolled out a ready-to-install storage-area network kit that combines ADIC's Fibre Channel tape libraries with host bus adapters, hubs, switches and software from a variety of vendors, including Ancor, Crossroads Systems and Emulex. The package includes precut, preterminated fiber-optic cables in various lengths. The ADIC Open SAN kit supports Unix, NetWare and Windows NT servers. The package starts at about $100,000.

ADIC: www.adic.com

IBM last week announced new RS/6000 Unix servers aimed at rival high-end servers from Hewlett-Packard and Sun. Among them is the S80, an AIX server that has 56 PCI slots and a memory capacity of 64G bytes and 45 terabytes of storage. IBM is also offering the HA-S80, a clustered version of the S80 for high availability. The servers are designed to handle Web serving, enterprise resource planning and business intelligence applications. IBM also announced the RS/6000 B50 server, geared toward small office or ISP environments. The B50 has 1M byte of cache, up to 1G byte of memory and up to 364G bytes of storage. Both will be available Sept. 24. The S80 starts at $290,000; the B50 starts at $3,995.

IBM: www.rs6000.ibm.com

Omnitron Systems last week introduced the FlexSwitch 600XC 2Fx and 4Fx compact switches that offer two or four Fast Ethernet fiber ports. The compact FlexSwitch 600XC 2Fx and 4Fx can be used as a backbone switch for connecting switched or shared segments and devices using fiber. The FlexSwitch 600XC 2Fx is available for $895 and the 4Fx costs $1,595.

Omnitron: www.omnitron-systems.com.

3Com spins off Palm Computing division

BY JOHN COX

3Com's decision to spin off its Palm Computing division into a separate company could speed the spread of handheld devices in enterprise nets, analysts and users say.

It's also a smart move for both companies, freeing them from the burden of juggling the demands of two very different product lines — 3Com's network business and Palm's handheld devices and systems software.

The network company will be able to focus exclusively on its core business, says 3Com CEO Eric Benhamou. He declined to comment on the continuing speculation, rife for months, that 3Com is seeking a marriage partner — a larger company that will acquire it. Spinning off Palm will make 3Com stronger on its own, Benhamou says.

The impact on 3Com's bottom line, for good or ill, will be minimal, says Phillip Redman, program manager with The Yankee Group, a Boston, Mass., market research firm.

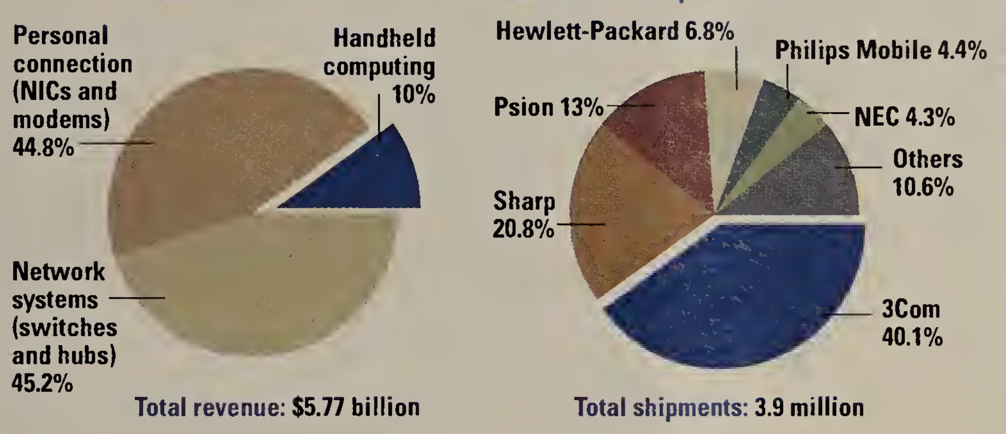
"The $500 or so million in gross revenue [from Palm] doesn't tell you what 3Com's profits were," he says. "Typically, profits from hardware products, especially in the price-conscious consumer market, are small." If the Palm initial public offering (IPO) is successful, 3Com shareholders will benefit because they'll be favored with Palm stock, Redman says.

"This spinoff has been a long time coming," says Gerry Purdy, president of Mobile Insights, a market research company specializing in mobile computing. "A networking company like 3Com absolutely must have a strong relationship with Microsoft. And Palm, of

See **3Com**, page 20

Palm to come out from under 3Com's wing

3Com CEO Eric Benhamou says his company's Palm division is ready to be a force on its own. Sales from 3Com's Handheld Computing division already make up one-tenth of the company's overall revenue, and the PalmPilot was the top selling personal digital assistant (PDA) in the U.S. last year.



*Note: 3Com's fiscal year ends in May.

Nortel upgrades Ethernet cards for ATM switches

EtherSpeed modules feature enhanced traffic classification, packet filtering and policy features.

BY JIM DUFFY

SANTA CLARA, CALIF. — Nortel Networks has rolled out enhanced Ethernet modules for its ATM switches that the company says support policy-based quality of service for converged campus nets.

The EtherSpeed II line of 10/100M bit/sec autosensing Ethernet switching modules fits into Nortel's Centillion and System 5000BH ATM enterprise switches. The modules include 24-port copper and fiber modules for the 5000BH, and 20-port copper and 16-port fiber cards for the Centillion 50 and 100 switches.

The new modules use silicon from Nortel's Accelar frame-based Layer 3 switches to classify traffic and improve packet forwarding, filtering and policy features, the company says. The new Application Specific Integrated Circuits deliver traffic classification, queuing, filtering and security capabilities at wire-speed, Nortel claims.

Each EtherSpeed II module has a newly developed 3.2G bit/sec packet segmentation and reassembly component that Nortel says improves the performance, throughput and scalability of the Centillion and System 5000BH switches.

EtherSpeed II modules also support Multi-Protocol-over-ATM Layer 3 switching and feature port mirroring, SNMP and Remote Monitoring data collection for management.

The EtherSpeed II 24-port 10/100 autosensing module for the System 5000BH is priced at $9,995 and is available immediately. The EtherSpeed II 20-port 10/100 module for the Centillion 50 and Centillion 100 is priced at $5,750 and will ship in October.

The EtherSpeed II 24-port 100FX module for the System 5000BH and the 16-port 100FX module for the Centillion 50 and Centillion 100 are slated to ship in December. Pricing was not disclosed.

Nortel: www.nortelnetworks.com

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- **Details about the EtherSpeed II family of switch modules.**
- **An article about the state of policy networks.**

www.nwfusion.com

3Com,

continued from page 19

course, has been competing with Microsoft's Windows CE."

Palm Computing will now be able to compete even more effectively, Purdy says.

As a public company, Palm will be able to aggressively license Palm OS software to any and all hardware vendors that want to build handheld devices and need systems software to run them.

Indeed, the widely anticipated new handheld device from Handspring, Inc., a start-up created by Palm's original founders, Jeff Hawkins, Donna Dubinsky and Edward Colligan, is an almost perfect example of Purdy's point.

Handspring's Visor, unveiled last week, comes in three models and runs the Palm OS software. But prices range from $149 to $249, which are considerably less than Palm's current product line, which starts at a newly reduced price of $229 for the Palm IIIe and ranges to $449 for the Palm V.

Handspring also created a special expansion slot, called Springboard, which lets users plug in attachments such as phones, bar code scanners and other peripherals. The attachments are ready to use and typically have their own batteries. A software development kit will let third-party firms create their own Springboard modules.

The spinoff from 3Com, coupled with the kind of third-party innovation that's possible through more companies such as Handspring, will strengthen Palm against its chief rival, Microsoft, and its Windows CE software.

"With the Handspring product, Microsoft can no longer think it will be able to steamroller over Palm and just walk away with the handheld market," Purdy says. "It's a wake-up call to Microsoft to step up to the plate and make its Windows CE environment better and easier to use."

Palm President Alan Kessler, who remains in place as 3Com hunts for a CEO who will report to the Palm board, has made it clear that this kind of software licensing will be a major part of Palm's mission and revenue going forward.

"Palm has the lead [in the palm-size market] right now," says Jatinder Singh, manager of mobile computing for Impact Innovation Group, a custom software development shop in Columbia, Md. "This spinoff [from 3Com] will help them do what's necessary to maintain that lead."

One of the necessary steps Palm needs to take is to devote more resources to integrating Palm devices and applications with the enterprise network.

"They're starting to put more emphasis on the enterprise, and with this spinoff [from 3Com], they'll be able to concentrate even more on it," Singh says.

3Com will likely make the IPO of Palm stock early next year. Four to six months later, it will offer the balance of the shares in the new company to existing 3Com shareholders.

Jim Barksdale, formerly of Netscape and now a managing partner in the Barksdale Group, and Gordon Campbell, president of Techfarm, have been named to the Palm board of directors. With Benhamou, they'll look for a CEO and additional directors.

Palm had revenue in fiscal 1999 of about $570 million, comprising about 10% of 3Com's total revenue. There are now about 600 Palm employees. ◪

System: 192.132.65.46

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Description: 17 Slot 2 P/S Fixed
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Serial Number: 199902050100009
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Internetworking Monitor . Scott Hamilton

DELUSIONS OF DIGITAL SUBSCRIBER LINE SERVICES

With new data services, hype often outpaces reality. Upon initial release, services are sparse, and the customer generally pays the price. As consumers, or advocates thereof, we desire choices, not the delusion thereof.

The providers that employ heterogeneous technologies are most likely to increase their breadth of service and customer base. Wireless technologies can be an effective means to increase service because they generally are quicker to deploy, cost less and are free from right-of-way issues. The convergence of wired and wireless technologies, along with increased competition, will make wideband connectivity a widespread reality.

Take, for example, my recent exploration of "high-speed" connectivity offerings. The choices were clear: cable modems or digital subscriber line (DSL). Or at least that is what the marketeers wanted me to believe.

However, cable modems are still not available in our service area. Purportedly, there are multitudes of xDSL options from our local regional Bell operating companies, competitive local exchange carriers and ISPs. However, to a certain degree they all rely on the RBOC (Bell Atlantic, in our case). So let's cut to the chase and look at Bell Atlantic's offerings.

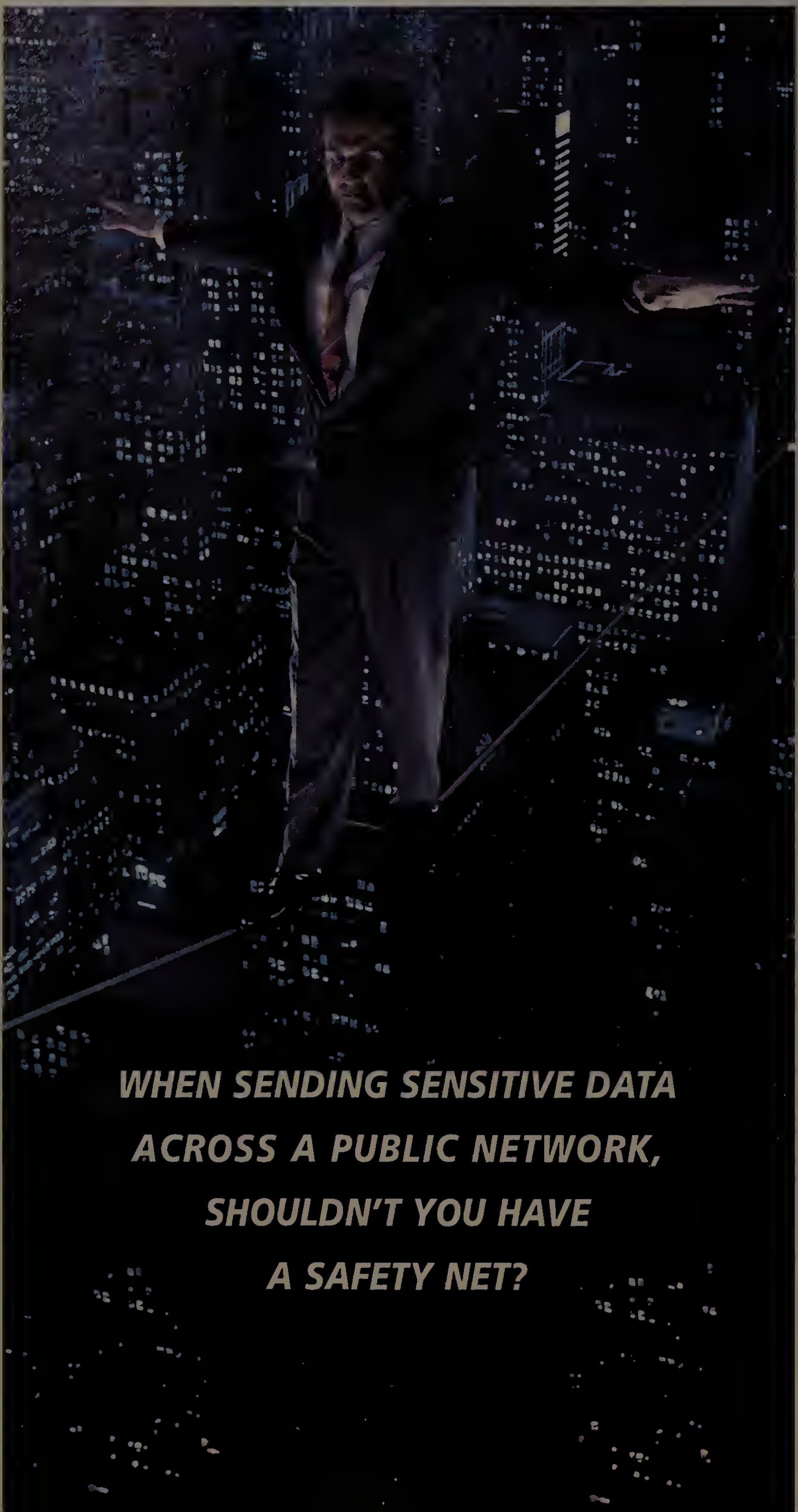
We examined the three-year costs for three asymmetric DSL variants and ISDN. The prices ranged from $4,380 for ISDN Basic Rate Interface to $27,520 for the carrier's highest rate Infospeed DSL (7.1M bit/sec downstream, 680K bit/sec upstream) service. These costs include installation, modems, monthly charges and usage. The best value is most easily represented using a performance-value metric of cost-per-K bit/sec, with an arithmetic average of the upstream and downstream throughput. The winner among the five services examined was $7 per K bit/sec for Bell Atlantic's Infospeed. In contrast, the worst value was $34 per K bit/sec for ISDN BRI.

According to the Infospeed Web site, service is available in our area. After I determined that the distance between our office and the central office was less than the distance limitation for even symmetric DSL, my hopes peaked that we could use the service.

However, Bell Atlantic checked the quality of the line and determined the circuits could not support xDSL. (In the weeks since our evaluation, Bell Atlantic now says service is available in our area.) The signal quality may be poor due to coils in the circuitry, taps in the line, or noise from ISDN or T-1 lines clustered in the same cable bundle.

In light of how quickly the representative offered to sign me up for ISDN services, you can't help wonder what incentive there is to dedicate bundles to xDSL (free from ISDN or T-1) when the associated revenue is significantly lower. If the consumer's interests were at heart, availability would be displayed on a detailed coverage map, not indicated by area code and prefix alone.

Scott Hamilton is vice president of operations of The Tolly Group's Wireless Applications Division in Phoenixville, Pa. He can be reached at shamilton@tolly.com. Hamilton is filling in for Kevin Tolly, who is on vacation.



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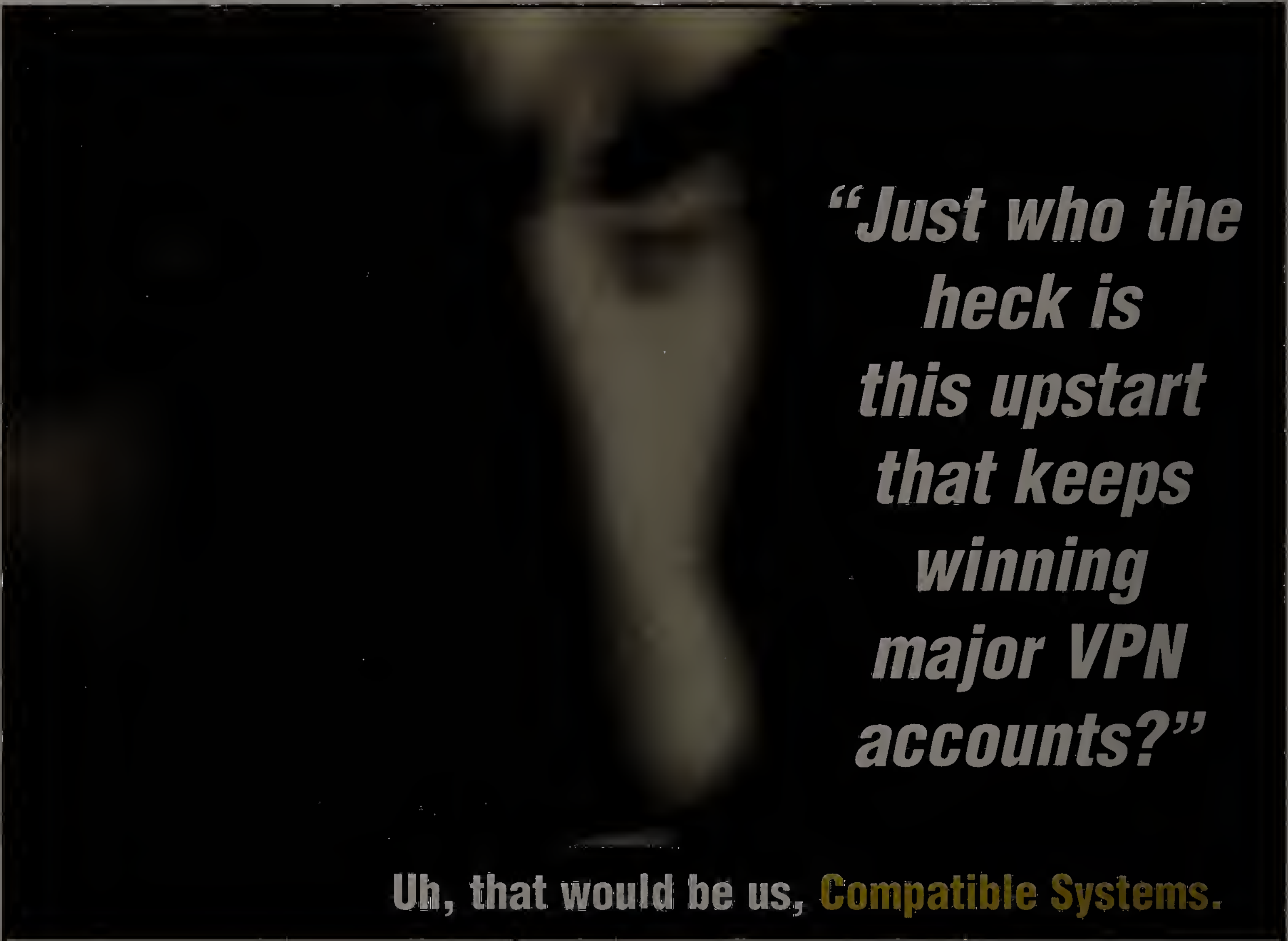
JOHN S DYKES



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Early adopters of VPNs—destined to play a major role in e-commerce—are separating the myth from reality surrounding security and reliability.

Eyes Wide OPEN

By Bill Laberis

NO MATTER HOW YOU look at them, virtual private networks (VPNs) loom very large in the hearts and minds of Network IS professionals.

For example, one in five companies already has a VPN up and running, a figure that will soar to more than half of all companies with a network by early next year. That's amazing growth, even to the most jaded information industry watchers.

According to International Data Corp., VPN service dial and dedicated connections will grow at a compound annual rate of 54% through 2002 and likely beyond that as well.

Considering that VPNs are very often replacements for private lines to move sensitive, business-critical data, you would think that users would have concerns about the security and performance of VPNs. And being prudent people by nature, Network IS professionals do not take security and performance lightly.

The content of this special section was designed from the ground-up to deal with these valid concerns. You'll read about the experiences of some pioneering VPN users and how they have addressed security and reliability issues. Our special section on VPN security talks about separating the unnecessary fear from the valid concerns regarding safe VPN implementation. You'll see how advanced users are parlaying the special features available only in VPNs to hatch the more effective e-commerce strategies.

Of course, this special section can only do so much to help you gain maximum insights about VPN security and performance. So Network World Technical Seminars has launched a multi-city tour titled, "Practical VPN Deployment: The Next Step." Hosted and directed by Eric Zines, senior analyst with TeleChoice and the author of our opening piece here, the one-day seminar is designed to teach you about the relative strengths and weaknesses of the most common approaches to implementing VPNs. And if you already have your VPN up and running, the seminar will address the critical issue of scaling and deploying your VPN across the enterprise.

For more information on "Practical VPN Deployment: The Next Step" log on to *www.nwfusion.com/seminars/vpn* or phone 800-643-4668.

But no matter where you choose to get your VPN education, get it soon, as there is little question that VPNs are destined to play a major role in the lives of Network IS professionals. This will become particularly apparent as enterprise network backbones built atop Internet Protocol (IP) foundations proliferate.

So climb aboard the VPN bandwagon. Just do so with your eyes wide open.✳

The VPN value proposition is clear, but getting to the next step requires careful examination of cost, security, management, and performance.

VPNs Step Up to the Enterprise

By Eric Zines

OVER THE NEXT EIGHT to 12 months, a new crop of Network IS professionals will be setting up virtual private networks. According to a recent TeleChoice study on VPNs, over 30% of businesses with WANs plan to implement or pilot a new VPN by this time next year. Clearly, Network IS professionals recognize and appreciate the value proposition and the benefits of VPNs, and are anxious to capitalize.

But what about the 30% of WAN users who are already testing or using a VPN? How are these early adopters doing? What are their plans? We put these and other questions to a group of VPN users, and the overwhelming answer was: GIVE US MORE! More users. More bandwidth. More applications. The top three changes VPN users plan to make by the summer of 2000 are: add more users, add bandwidth, and add partners.

Based on these responses, three clear themes emerge. First, users are ready to grow their VPNs past the pilot phase by increasing bandwidth and by supporting more users. Second, extranets are the next application wave for VPNs, and a large number of organizations will be opening up their networks to partners and customers. Finally, it looks as if some VPN users will be taking the first cautious steps toward network convergence by enabling IP voice or video over their VPNs. These goals can all be boiled down to one common need: scalability.

SCALABLE SECURITY SOLUTIONS Many VPN managers who plan to add users to their VPNs are in for a rude awakening. Unfortunately, most of them have implemented manual, labor-intensive means of managing user authentication and encryption key exchange. This is fine for a small pilot, but will absolutely not scale to enterprise proportions.

Certificate Authority (CA) solutions are the best option for Network IS professionals who wish to manage a large number of VPN users. CAs offer a scalable, easy to manage solution for both authentication and key management. And because certificates based on X.509 are the closest thing that we have to a standard for key management, it's the best bet for building an interoperable extranet.

CAs are the key to scalable Internet Protocol Security (IPSec) VPN implementations, and are the enabling technology for adding users, adding customers, and including partners. Now here's the bad news: Only 20% of VPN managers plan to add digital certificates in the next year. To those who are planning to grow their VPN without a CA...best of luck. We'll pass all of the resumes of good Network IS professionals their way; they're going to need them.

BEYOND THE BORDERS As our early adopters have realized, VPN network architectures are superior to any other WAN solution when it comes to enabling extranets, which are really nothing more than specialized security policies. These policies allow specified "outsiders" to access only particular, pre-determined resources on a company's network.

Enabling an intranet VPN to support extranet connections is a fairly simple undertaking, which can be as basic as defining a new class of users with limited rights on the network. There are, however, a number of nuances to designing an extranet VPN that can directly impact the safety of the data. In fact, the most challenging part of

continued on page 30

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15 MIN. 45 SEC.

Set up Certificate Authority
14 min. 52 sec.

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Mortgage Investors Group leverages the VPN functionality built into NT 4.0 as an inexpensive solution to connecting a rural office.

IF YOU DON'T THINK VPN technology is a pretty new thing, just try and name a few of the dedicated VPN vendors. Outfits like RedCreek Communications, Newark, Calif., and TimeStep Corp., Kanata, Ontario, are not exactly household names—yet.

And even the big guns have yet to really stand out from the VPN crowd. While everyone knows Windows NT, fewer among us could actually name Microsoft's VPN offerings.

As a result, VPN users like Lawrence Lee, manager of information systems at Mortgage Investors Group, headquartered in Knoxsville, Tenn., are pioneers, blazing a trail without any clear product roadmap.

PATRICK MURPHY-RACEY

Lawrence Lee, manager of information systems at Mortgage Investors Group

Dipping a Toe in VPN Waters

By Doug Barney

It's ironic, you can monitor and control every aspect of your Wide Area Network — except the bandwidth that makes it work.

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That is the journey that inveterate scuba diver Lee embarked upon, a journey prompted by an expensive little problem he faced. "Although I had been reading about VPNs for some time, I first started looking at using VPN technology when we opened a small branch office for three people in Crossville, Tenn., a rural county about 80 miles outside of Knoxsville," Lee explains.

The problem was the cost of connecting the rural branch into the company's urban headquarters. "When I found out how much the local telco wanted for their data lines, I couldn't believe it. There was no way I could justify the cost of these lines for such a small office," Lee says. Try $2,500 a month for a 128K fractional T-1!

LIGHT AT END OF TUNNEL Nor could Lee justify an expensive dedicated solution to his VPN problem, especially given the early state of this emerging technology. So Lee looked at what he currently had, and discovered an inexpensive, effective answer already installed, the Point to Point Tunneling Protocol (PPTP) technology built right into Windows NT.

"I started looking into the VPN functionality built into Windows NT 4.0 as an inexpensive solution," Lee says. "Bottom line—while it's not ultra sophisticated or secure, it's adequate for our needs."

For an early adopter, Microsoft had a lot of the right stuff. It was a snap to set up and configure, and did the job.

Each branch office now has the same basic setup, a POTS (plain old telephone service) line, a modem, and a dial-up Internet account. Once the office hops onto the 'Net, it tunnels into the Mortgage Investors Group corporate network, and then work with the loan software can begin.

So how much does the VPN cost? Well, it's not $2,500 a month. In the case of the Crossville office, so far it is costing about $150 a month for two phone lines and two dial-up accounts. And once Lee installs a LAN and ISDN, speed will improve dramatically, while his cost will only go up about $10 a month.

Lee expects to be diving deeper into VPNs in the future.

STEVE GERRARD

MOM SAYS THANKS The VPN has been great for the small branches, but it has been a godsend for work-at-home types, like new mothers. "Since installing our VPN, we have started using it to allow some of our [loan] processors to work from home, as well as loan officers who want to take applications in the field," Lee says. And there is no end in sight. "Someone asks me about remote access at least once a week."

For Bridget Pemberton, a mortgage loan processor for the company, the VPN may have saved her job. Bridget recently gave birth to her daughter Anasten. "I love my job, and when I got pregnant I was absolutely torn." Pemberton wanted to keep her job, but did not want to put her daughter in day care. The solution: She set up her home PC to connect to the VPN so she could do her job, and watch her baby.

Now, Pemberton connects anytime she wants and accesses the loan origination software and loan database via modem. "It's very simple; I connect to MindSpring and then connect to the VPN. It is as easy as when I was sitting at my desk," she says.

HOW IT ALL BEGAN When Lee first started working for the company as a consultant years ago, things were relatively primitive. Windows 3.1 and DOS ruled the desktops, and "those branches that had a LAN were running Artisoft's LANtastic peer-to-peer NOS," Lee explains. "Every branch was running individual copies of our loan origination software, and every copy was a different version.

Data consolidation was no better. At the end of each workday, someone in the branch office was charged with exporting all the day's loan applications, which were retrieved at headquarters via a modem. All that information was then brought into a master database. "From an administrative point of view, this was simply unmanageable. We needed to consolidate all of the individual copies of our loan origination software into a single copy that was run over a WAN," Lee explains.

The result was a move to Windows 9x or NT.

The company also built a nine-site WAN on T-1s, fractional T-1s, DS-0 over frame relay, and switched ISDN. The company has even built an 11Mbit/sec wireless connection for an office a scant three quarters of a mile away from headquarters.

The advantages were pretty sound. All branches worked off the same loan origination software hosted on an application server in the Knoxsville headquarters. And every user was given e-mail and Internet access over the WAN.

But expanding its wide area network the old way was beginning to prove too expensive and inflexible. Thank goodness for that out-of-the-way branch office that led Mortgage Investors Group to its VPN future.

MORE TO COME With his Windows NT focus, Lee is very interested in what Windows 2000 has to offer, especially its support of the popular and well regarded IP Security (IPSec) standard. And as the branch offices grow, Lee might even find himself installing an ISDN router and a LAN or two. All to tie into the VPN, of course. ✳

Doug Barney is executive editor, news, at NetworkWorld.

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The need for fast, secure, and affordable business-to-business connectivity fans the flames heating up the VPN/e-commerce marriage.

The Latest 'Net Romance?

By Lenny Liebmann

Eli Ladopoulos, director of global information security, Instinet

MICHAEL MAZZEO

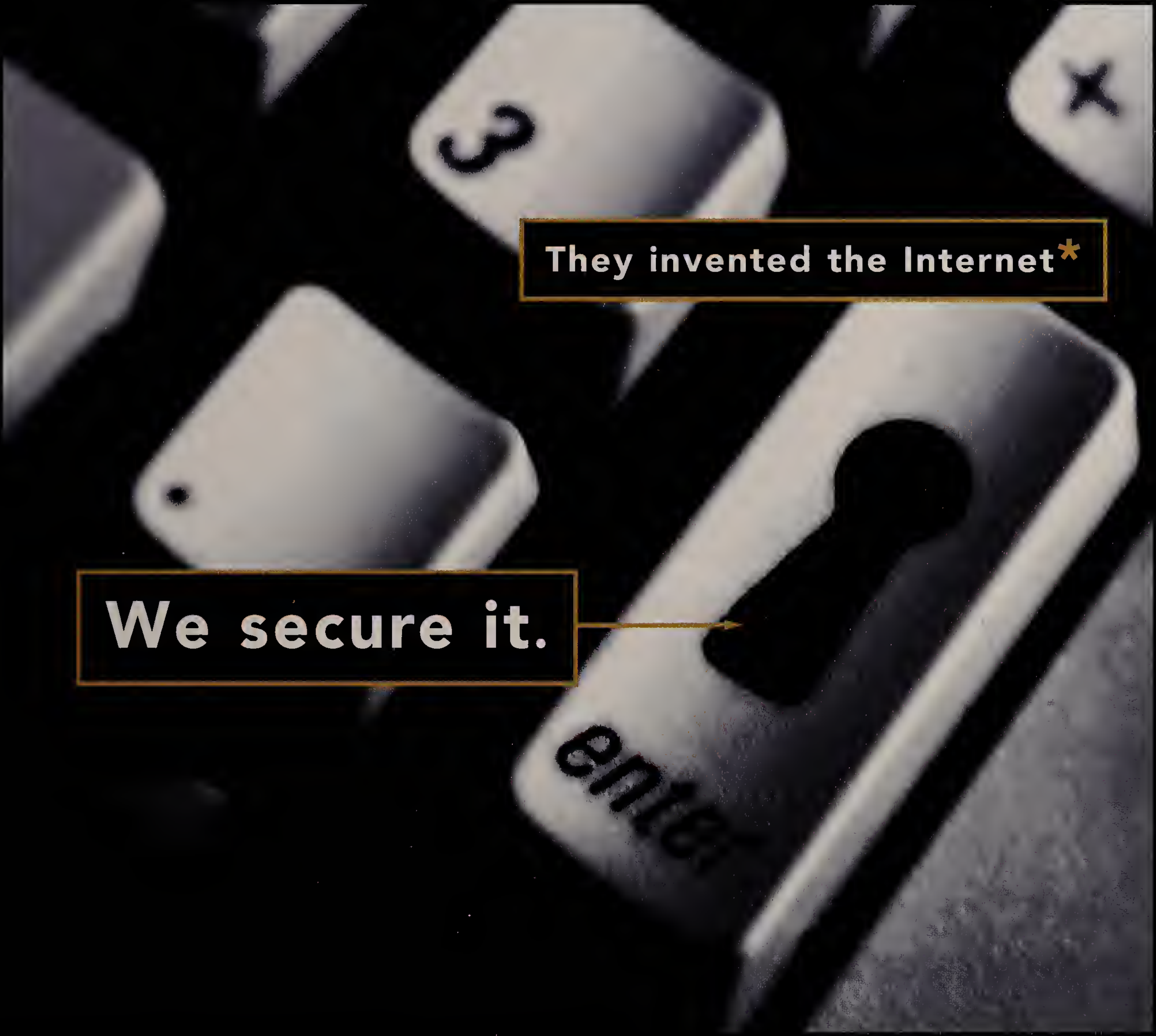
a QUICK-AND-DIRTY SSL connection may be safe enough for a consumer to use a credit card at a Web site, but it doesn't cut it when it comes to serious business-to-business trading activity. Private EDI (electronic data interchange) networks, on the other hand, seem overly expensive and slow to provision in an age of ready Internet access.

So how can you combine the speed and economy of 'Net-based connectivity with the security of a private network?

You set up a VPN, naturally.

VPNs are a natural fit for business-to-business e-commerce. They allow companies to set up encrypted links to known trading partners, with a bandwidth-for-the-buck ratio that other technologies can't match. And, with management solutions that can now handle thousands of connections simultaneously, VPNs can scale to support even the largest trading networks.

At St. Louis-based agri-chem giant Monsanto, for example, VPNs are now being used to maintain close working relationships with third-party contractors all over the world. According to Monsanto network architecture analyst Bill Leonard, the ability to quickly provision a network connection anywhere in the world is essential to supporting the company's fast-paced business requirements. "In Japan, you can wait two to three months to get a circuit set up," he explains. "With our VPN, we can do it in a matter of hours."



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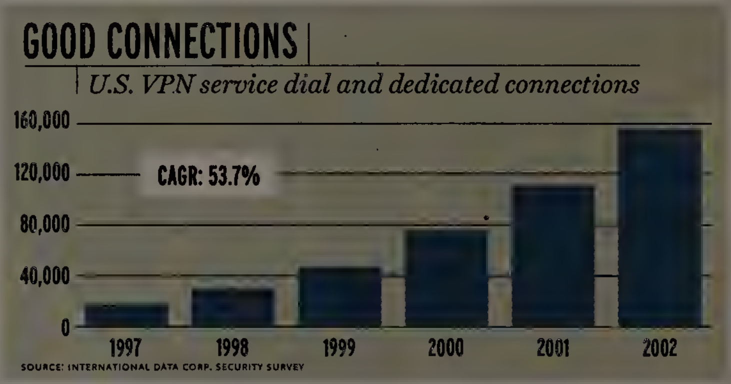
One reason Leonard can set up VPN connections so fast is that he can do some groundwork before flipping the "on" switch. "These contracts are usually negotiated months in advance," he notes. "But you can't set up a connection until the contract is actually signed." However, once the contract is signed, Leonard needs to be able to open up a circuit immediately. "If it's some kind of 90-day trial agreement, you can't very well wait two months to get your circuit up," he observes.

GOOD CONNECTIONS

U.S. VPN service dial and dedicated connections



SOURCE: INTERNATIONAL DATA CORP. SECURITY SURVEY

Of course, extensive use of the Internet for this kind of connectivity can have a significant impact on a company's overall 'Net usage. "This stuff is growing like a weed, so you have to make sure you're sizing your 'Net connection accordingly," he advises. "Otherwise, that will become a bottleneck."

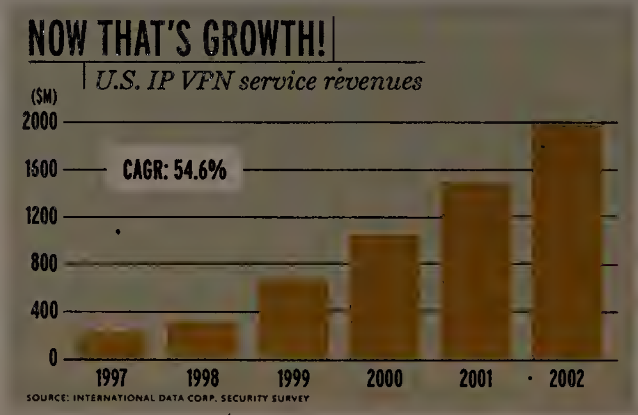
In Monsanto's case, that means moving from T-1s and multiple T-1s – replacing them with DS-3s and fractional DS-3s. "In most of the metropolitan areas where we operate, the price of bandwidth has come down low enough where we can afford to buy much bigger pipes," says Leonard. "We're more than offsetting those costs with what we're saving by using the Internet." A 256 Kbps connection to Japan, for example, would normally cost Leonard $12,000 per month. "I can buy a lot of Internet for that amount of money," he says.

Like many other VPN users, Leonard hasn't experienced the latency problems that some experts say make the public Internet unsuitable for business-to-business connectivity. "For the most part, we haven't seen delays of over 100 msec over the Internet," he says. "And anyway, the applications we're deploying today aren't that latency-sensitive."

SELLING CONFIDENCE Maintaining security is particularly important for New York-based Instinet Corp., a global agency brokerage. Security is obviously important for anyone handling millions of dollars in transactions, but it's also a key component of Instinet's value proposition to its institutional customers. "We provide complete confidentiality with respect to our clients' trades," says Eli Ladopoulos, director of global information security. "That way, customers can make large trades without worrying about how those trades might influence other traders."

NOW THAT'S GROWTH!

U.S. IP VPN service revenues



SOURCE: INTERNATIONAL DATA CORP. SECURITY SURVEY

Thus, for Instinet, encryption not only allows them to use the Internet securely, but it also ensures that customers can't see each other's trading activity on Instinet's own network.

Like Monsanto's Leonard, Ladopoulos is very concerned about scalability. "We have to be able to maintain optimum performance as trading volume rises," he says. That's one reason he settled on Santa Cruz, Calif.-based Network Alchemy Inc.'s VPN server solution. "I really like their clustering capability," he says. "If I need more performance, I can just throw another box in there."

He also sees standards such as IPSec (Internet Protocol Security) and PPTP (Point to Point Tunneling Protocol) providing him with a lot of flexibility in how encryption is implemented between Instinet and its customers. "On their end, the customer can implement the VPN at their firewall, or across a specific subnet, or even take it right down to the workstation level," he explains. "As long as they implement the standard, we can meet whatever particular requirements they have."

TURNING TO TURNKEYS Despite the fact that standards are helping organizations such as Monsanto and Instinet deploy VPNs, IDC analyst Melanie Posey says that the complexity and compatibility issues associated with having multiple business partners participate in a VPN can be avoided by using a turnkey service provider. "You can get around a lot of problems by having everyone use a solution that comes from a service provider, rather than a 'do-it-yourself' kind of operation where everyone has their own ISP and their own hardware," she says. IDC predicts that VPN services will reach approximately $2 billion by 2002, up from just over $200 million in 1997.

Posey also points out that larger service providers can offer VPN services over their own private backbones, which can help allay customer concerns about security and performance. "With private IP networks, there's more control over who you're sharing the pipe with," she says, "and you can get the international coverage that a lot of people are looking for because of the cost factor."

While VPNs and e-commerce make a great match today, the long-term future of the relationship will hinge on how well VPN vendors deal with reliability issues such as hot fail-over capabilities – which will become increasingly important as VPNs are called upon to support more critical virtual business relationships – as well as how emerging security technologies such as certificates create alternative means of creating fast ad hoc 'Net connectivity. But, for now, VPNs provide a very practical solution for quick, secure e-commerce infrastructure. ✻

Lenny Liebmann is a Highlands, N.J.-based consultant and writer specializing in the technology and business of networking and e-commerce.

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IDC's Abner Germanow suggests viewing VPNs today as a way to augment an existing network and make it more flexible.

VPNs Ready for Prime Time ... ALMOST

Abner Germanow, senior research analyst, Internet security, IDC

PETER SMITH

By John Kirkley

Q **Are Internet VPNs ready for prime time corporate applications?**

A: The answer is clearly yes. But, are VPNs ready for extremely high-value, mission-critical applications? They're close, but not yet. However, today's VPNs can be used to implement a large number of applications, which would not be feasible using private lines. VPNs are ideal for connecting widely distributed environments — think of a large insurance firm with agents scattered around the country. The technology can provide connectivity in areas where it was not feasible before.

Another fast-growing VPN application is linking the enterprise with its suppliers and partners, especially those that are international. For example, suppose a large shoe company wanted to shift its business from a supplier in Indonesia to one in Malaysia. The cost of changing a private line or frame relay network connection and dealing with all the business process issues would be prohibitive. Given the flexibility of a VPN, it becomes a relatively easy thing to do. So when it comes to private lines vs. VPNs, forward-thinking companies are not only looking at expense, but they are seeking flexible solutions that allow them to adapt to unique work environments and rapid changes in the marketplace.

Q: How do Internet VPNs compare with traditional solutions for enterprise networking in terms of cost, security, and performance?

A: A service provider can control the various levels of service on a VPN that is implemented over its existing infrastructure, but when implementing a VPN over the Internet, you really have no control over Quality of Service [QoS]. However, for companies with highly distributed environments — like the insurance firm or a chain of fast food stores — the potential productivity of flexible Internet VPN connectivity far outweighs the concerns about QoS. In the early days of frame relay, there was a period where you had complete control over private line service levels and almost no control over frame relay QoS.

ip network innovation

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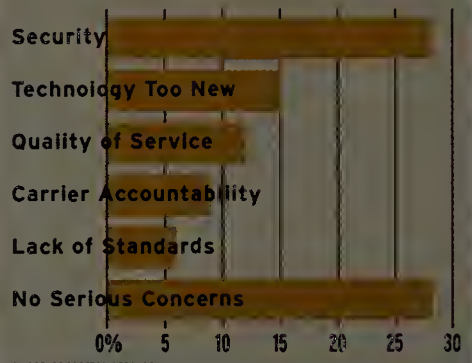
Various vendors developed software to solve that problem. Now the same thing is happening with VPNs—a number of solutions are on the horizon that will allow for full control of service levels.

Q: What about VPN security now and in the near future?

A: There are developing standards like IPSec [Internet Protocol Security], which concentrate on protecting the tunnels and encrypting all traffic. IPSec designers are working on solutions that address security once the individual is inside the network. Positive steps in this space include the integration of private key integration (PKI) and digital certifications into VPN solutions. Directory deployment, for example, will provide total security — everything is encrypted. IPSec is incorporating a variety of new authentication methods, ranging from smart cards and digital certificates to biometrics.

WHAT? ME? WORRY?

When asked, "What are your VPN concerns," IT managers said:



SOURCE: FORRESTER RESEARCH

Security depends, to some extent, on the type of VPN you are using: LAN to LAN; remote access to client/server; or extranet. For example, with an extranet, Network IS professionals may want to place some security software on everyone's client computers, but this is not going to fly in a large, multi-enterprise environment. So managers are using SSL and SOCKS [a circuit-level security technology which secures the flow of data at the TCP layer] to secure the pipe, and various other authentication mechanisms to identify the users and allow access to applications. In terms of security, we have tended to worry more about external threats rather than internal ones, but in the near future, VPN security will control access for all clients, regardless of who and where they are.

Q: What about the cost of VPNs relative to reliability and performance?

A: VPNs are frequently used to augment private line or frame relay networks by replacing the enterprise's most expensive links — often international locations. These kinds of decisions depend on your choice of service provider, the geography of the network, and bandwidth usage. It may seem to make sense to use both the Internet and your existing network infrastructure for an application, but what you may save in money may be more than offset by a degradation in performance caused by routing your traffic across several different networks. You may be much better off using the Internet for the entire application. Of course the reliability of an Internet VPN is only as good as the Internet itself — and, as you know, the Internet has its problems. But as we begin to implement directory-enabled networking, each IP packet will have its own QoS attached, which will significantly boost the performance and reliability of Internet VPNs.

Q: How effective are Internet VPNs for linking telecommuters, and mobile and remote users to corporate resources?

A: A lot depends on whether your VPN is going over the Internet or is implemented over your ISP's network. In the latter case, if you need to connect a user or location that is not near one of the ISP's POPs, your costs go up and performance and reliability may suffer. However, the growth of ISP Internet POP locations and revenue sharing agreements around the world is making it increasingly easier for telecommuters, and mobile and remote workers, to connect to the Internet through a local POP, link to the VPN, and access corporate resources. So, instead of worrying about having, say, 50 people in Texas, 100 in California, and 30 in Duluth, you simply have each mobile or remote worker open an individual ISP account. High-speed connectivity options, such as DSL and cable, are becoming widely available, making this option even more attractive. I know of people who have better Internet connectivity at home than they do at work.

Q: Are the ISPs committed to investing in the infrastructure to continue the growth of Internet VPNs?

A: Of course. To stay competitive, ISPs continually upgrade their infrastructure, which is essentially the same for all its services, including VPN. What is somewhat different is the customer premise equipment that they are beginning to offer — for example, new CPE routers or firewalls that have VPN functionality built in.

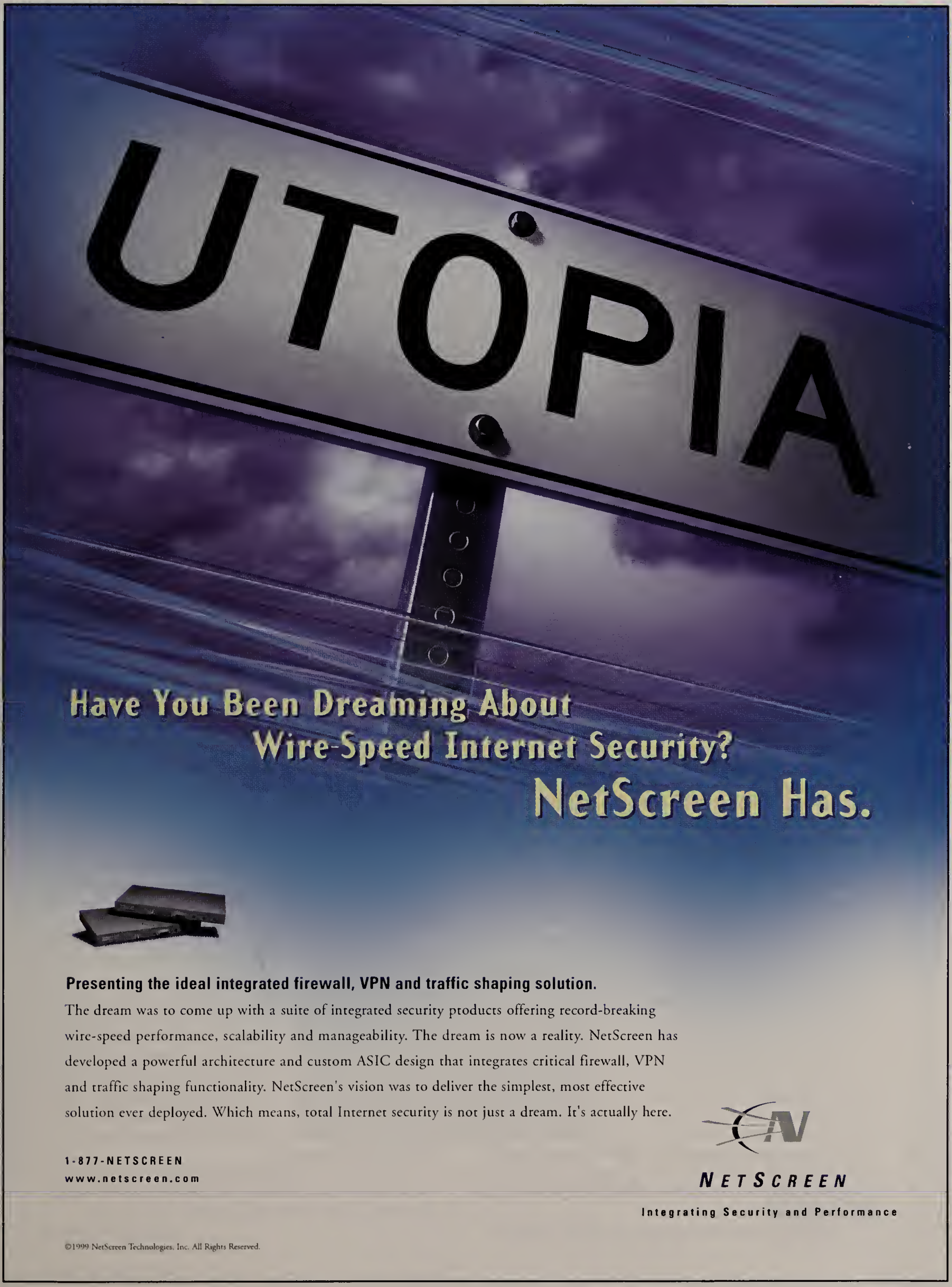
Q: What are some of the steps Network IS professionals need to take to prepare their enterprises for Internet VPNs?

A: One way to get started is to make sure that all new clients issued by the IT department are VPN-enabled even if you're not currently using the technology — if and when you decide to make the transition, it will go much more smoothly. For LAN-to-LAN connectivity, identify the most expensive legacy connections and decide whether or not to migrate them to a VPN. For remote access VPNs, determine the location of your user base. If they are all calling in from the same area code as your headquarters building, converting doesn't make much sense. But if your users are all over the world and your 800 number bills are outrageous, then an Internet VPN may be the answer.

Q: So, should Network IS professionals unplug their current frame relay networks and rush to install Internet VPNs?

A: Not a good idea. At this point, it's wisest to view VPNs as a way to augment your existing network in order to make it more flexible and less costly to run. As a matter of principle, Network IS professionals don't like to tear everything out for a hot new technology, and there is no reason why they should start with VPNs. Instead, they should look for VPN solutions that will work with their existing legacy infrastructure and will lessen, rather than increase, their management headaches. ✳

John Kirkley is a freelance writer based in Warwick, R.I. A former editor of Datamation *magazine, he has been involved with the computer and communications industries for more than 35 years.*



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Contrary to prevailing fears, VPNs can actually be more secure than private WANs and can be used to supplement security of existing WANs.

VPN Nuts & Bolts

By James Barthold

WITH VIRTUAL PRIVATE networks proliferating, and being increasingly pressed into service to handle business-critical network tasks, it's not surprising that Network IS professionals are asking hard questions about security and performance.

Understand that, by its nature, a VPN is a system that is designed to securely connect remote nodes to a network segment, while controlling access to resources and providing authentication. This may connect two network segments, or provide access to an e-commerce system for new customers. But in any case, VPNs can actually be more secure than private WANs and can be used to supplement the security of existing WANs.

SURPRISED? The fact is that VPNs have been plagued by a number of myths. One myth holds that VPNs are slow, and thus slow down computers. While the encrypted packets VPNs create do require more CPU cycles to construct than normal packets, most of today's faster processors can easily handle the additional load. Most VPN solutions now ship with optional hardware encryption engines that can dramatically increase the number of simultaneous connections.

VPN Security Evaluation Checklist:

✓ What authentication types are supported?
✓ Does it run on top of a hardened OS?
✓ Does it allow protocol filtering?
✓ Does it support packet signing?
✓ Does it support packet encryption?
✓ Is firewall integration possible?

Another myth says that VPNs are difficult to manage or can't be easily integrated into existing network infrastructures. Many VPN solutions can directly replace existing network hardware with little additional configuration. And many VPN solutions can be monitored via traditional network management products such as HP OpenView.

Of course, there are a number of security considerations that need to be addressed when deploying VPNs within existing LANs and WANs. VPNs can wreck a corporate security system if they're not properly deployed, and they typically offer no more security than private or dedicated connections.

VPN traffic is by nature encrypted so it cannot be analyzed until after the tunnel has been terminated. This fact may make it easier for someone to use a business partner's network to penetrate another corporation's network. Few VPN solutions are default-deny implementations, therefore they do not block any IP ports of services. They are designed to emulate a normal private connection but use a public network as the transport medium. This means that the traffic is encrypted only in transport.

A VPN that terminates within the corporate network will allow illicit traffic into and out of the network just as readily as desired traffic unless the tunnel is specifically configured to block it. Unless the VPN is terminated within a firewall or DMZ it will decrease internal security. VPNs that terminate within firewalls typically allow policy and user-based tunnels, offering a higher level of security.

With VPNs, as with other technologies, security and performance considerations can depend upon the use of the VPN, and for VPNs there are four primary uses:

continued on page 30

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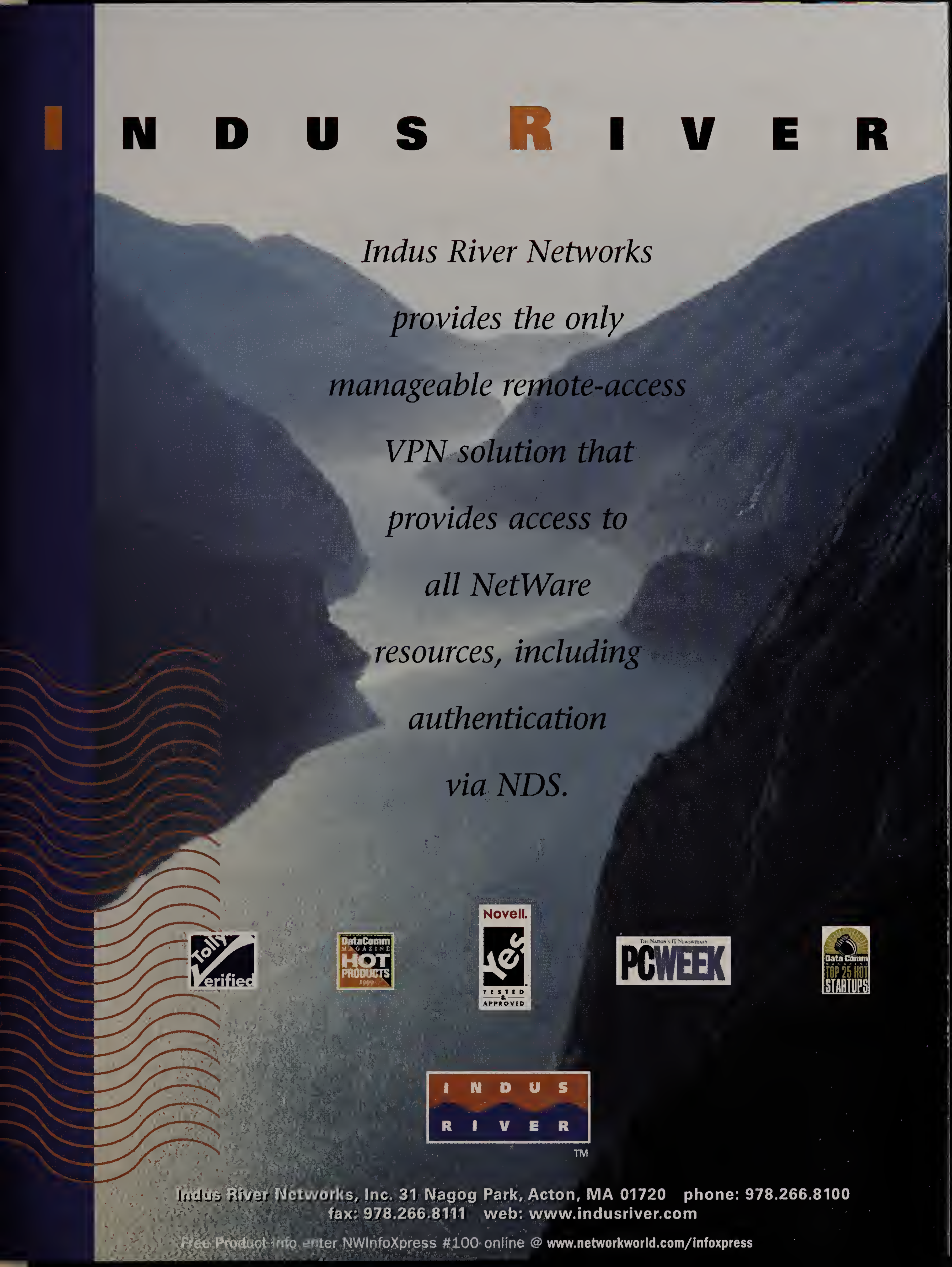

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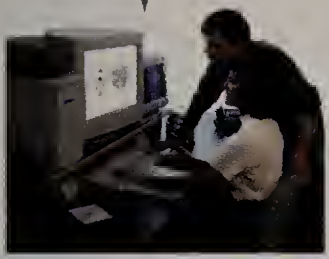

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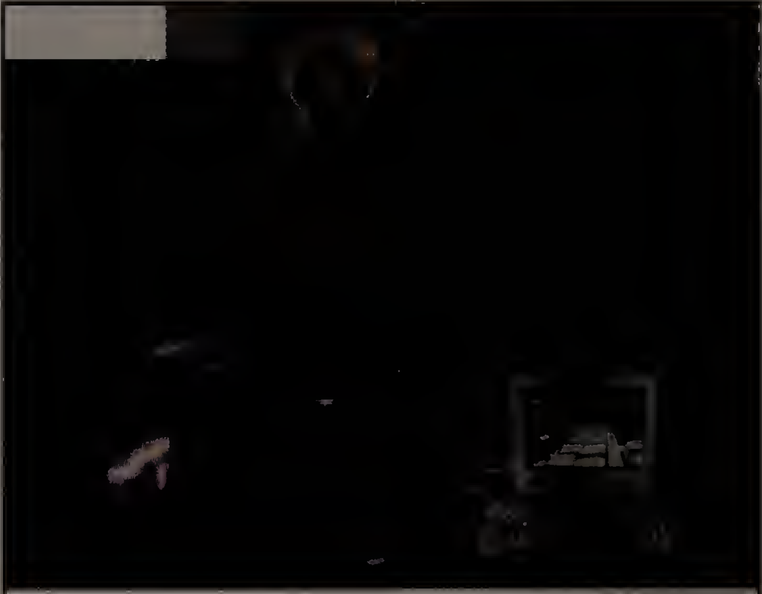

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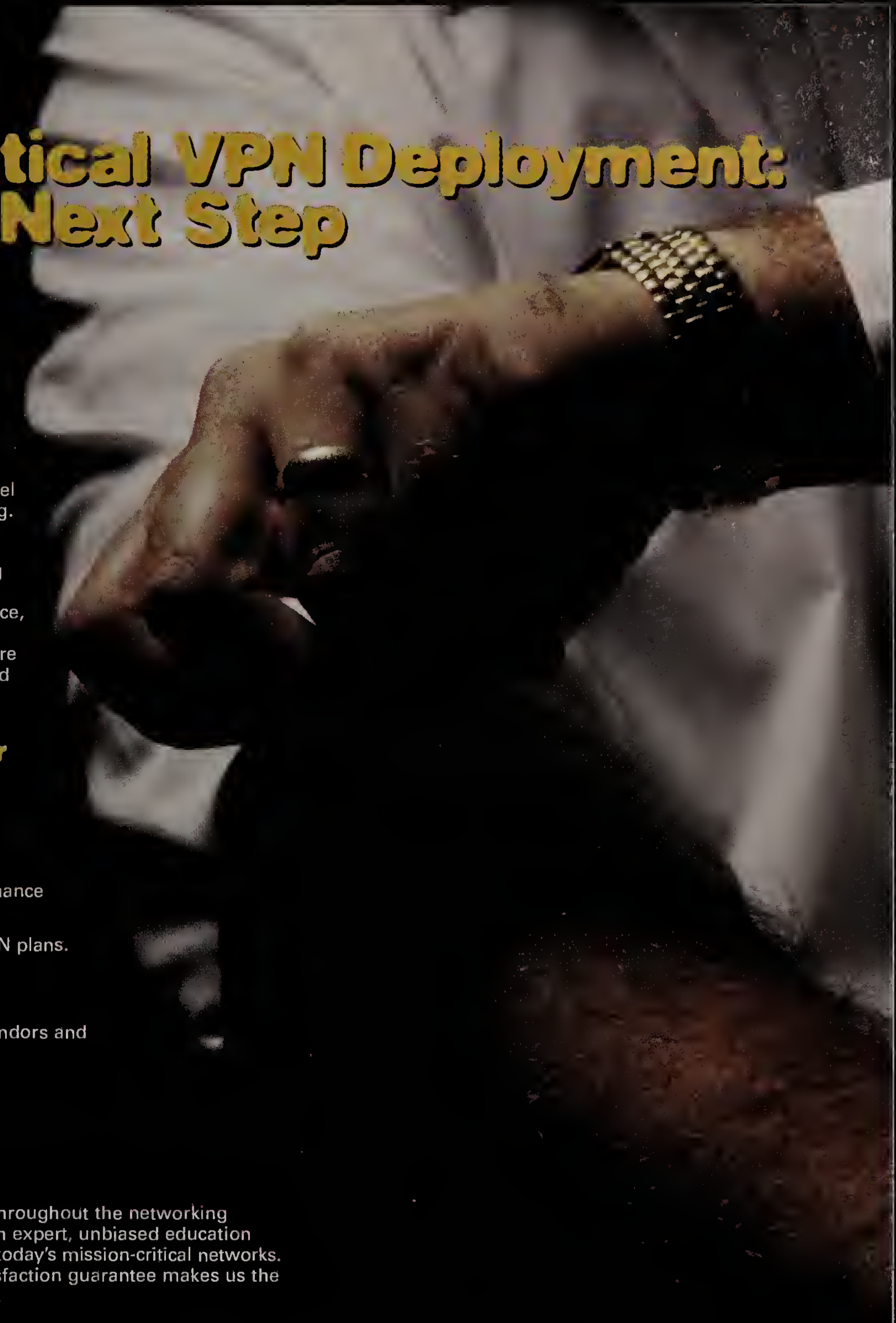

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VPN Nuts & Bolts

continued from page 18

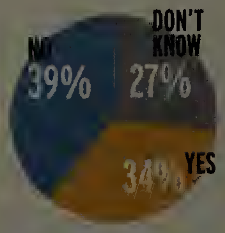
- To connect remote sites to WANs;
- To connect remote users to networks;
- To connect business partners together; and
- To connect remote users to systems.

VPNs DU JOUR The first widely deployed VPN type is VPN RAS (virtual private networking for Remote Access Services). This solution replaces older direct-dial systems frequently accessed via long distance phone lines. Organizations that are still dialing long distance are probably better served by this solution. Most currently deployed VPN solutions are based on this technology. Network managers should be aware that this is one of the fastest ways to connect home offices to the corporate network.

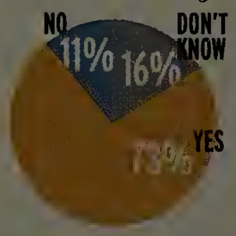
VPN RAS offers potentially high connectivity speeds for users everywhere because it allows users to take advantage of the highest connectivity speeds available in an area. Many hotels are now offering T-1 access in rooms and business centers. Another bonus is for workers who have the option of telecommuting. Users of ISDN, DSL, and cable modems can all leverage those high connection speeds as never before by creating a tunnel directly into the corporate network. Client/server systems that could not be accessed via modem may be available to remote users for the first time by combining VPN RAS with high-speed local access.

SUDDEN IMPACT

Q: Will VPNs reduce or alleviate network security concerns?



Q: Will VPNs enable new connectivity?



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Most VPN RAS systems are easy to tie into existing RAS systems and security systems due to the integration of systems such as RADIUS (Remote Authentication Dial-In User Service). In many cases, older RAS systems can be unplugged from the network and directly replaced by VPN servers. The downside to VPN RAS is that most systems today require substantial user training.

For a successful VPN RAS deployment, be careful to include a migration plan for user accounts, user training, and dial-in lines. If this is a new implementation, have a plan for account creation and account maintenance, including exits. Disaster recovery planning should include plans for a hot spare or cold spare or both. Obviously the redundancy of a hot spare is preferable in large or critical installations. Many sites prefer to retain some dial-in RAS.

The second widely deployed VPN type is VPN WAN. This solution replaces direct WAN links built from frame relay and direct digital connections. The cost-effectiveness of this solution varies around the globe.

Some firms are combining VPN WAN services with WAN connections to increase the security of their frame relay clouds. Domestically, it is easy to purchase as much reliable bandwidth for a WAN as costs will allow. Dedicated circuits can therefore have a higher bandwidth potential than VPN circuits tunneled through the Internet.

If the nature of WAN traffic is primarily e-mail and file transfers, then this site may be a prime candidate for VPN. The two limiting factors for general use of VPN WAN solutions that tunnel through the Internet are latency and lack of dependable bandwidth. Although these factors can also affect internationally deployed VPN WAN circuits, most companies cannot afford enough international bandwidth to compete against the low cost of VPN. The downside is that the legality of VPN use varies from country to country.

The final VPN type, VPN client/server, is new and is seeing rapid growth. VPN client/server has evolved from SSL-enabled pages on Web servers into freestanding dedicated SSL encryption engines. This solution is designed to allow remote users equipped with just a Web browser to securely connect to a specific server. The advantage of this solution is that it is by far the easiest to support because users don't need any dedicated software on their PCs other than a Web browser that supports the required level of encryption. ✳

James Barthold is an independent consultant in Stowe, Mass.

VPNs Step Up to the Enterprise

continued from page 4

building an extranet may be selecting from the many architecture options. One approach to enabling an extranet, for example, is to set up a demilitarized zone (DMZ) to support outside users. This solution provides firewall protection for the intranet and the extranet resources, as well as data integrity and confidentiality via the IPSec VPN gateways. Again, this is just one of dozens of possible approaches to enabling this functionality.

So far, early VPN adopters are pleased with their networks. In fact, they're so convinced that they've done the right thing, that they're planning to invest more time, money, and resources into expanding the size, coverage, and utility of their VPNs. To get to the next step, VPN users must carefully examine the cost, security, management, and performance implications of VPN options and architectures. There's a world of difference between pilots and enterprise deployment! ✳

Eric Zines is a VPN specialist and senior analyst at TeleChoice Inc. in Boston. He is also the seminar leader of Network World's VPN Technical Seminar entitled, "Practical VPN Deployment: The Next Step."

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IBM's acquisition strategy: Shop (quietly) till you drop

BY MARC SONGINI

As transformations go, IBM's has been more like a glacier melting, rather than Clark Kent changing into Superman.

But in an effort to morph itself from a hardware-centric company into a more software- and services-oriented firm, IBM has over the past four years spent some $8 billion to acquire almost 60 software and services firms worldwide. Some of the purchases have been high profile, such as that of management software maker Tivoli in 1996. But most of the buys were much smaller and attracted little attention.

The company's current acquisition strategy reflects its overall transformation into a software-, services- and technology-oriented firm, says Frank Dzubeck, president of a Communications Network Architects, a Washington, D.C., consultancy.

Acquisition plans

With this transformation in mind, IBM plans to make other acquisitions, company executives say. According to Lee Dayton, an IBM corporate development executive, Big Blue is interested in software companies that have middleware products which could complement IBM's own lineup, such as the DB2 universal database, Lotus Notes and the WebSphere Web serving products.

Other possible candidates for purchase include firms that could boost IBM's Tivoli enterprise systems management products, Dayton says. Since buying Tivoli, IBM has purchased three other software companies to fill out Tivoli's management suite. One of those acquired was Software Artistry in 1998, which gave Tivoli service management applications.

Service companies will continue to pique IBM's interest. "We continue to be interested in acquiring service companies — we want to grow Global Services [IBM's service provider division]," Dayton says. Businesses that produce communications technology are also an IBM acquisition target, he says. Although IBM has opted to sell off its routing and switching products and technology to Cisco, it still wants to be an OEM supplier to the network processor market (*NW*, Sept. 6, page 1).

When IBM bought Sequent, it not only gained new server lines, such as the NUMA-Q 2000, but it also acquired Sequent's large service organization.

IBM is a major chip player and would like to continue building up that business, especially in the field of wireless communications, Dayton says. IBM made one wireless acquisition in 1998 when it bought CommQuest, a firm that designs and markets semiconductors for wireless communications over cell phones and satellite communications.

ACQUISITIONS

IBM is slowly transforming itself into a software-, services- and technology-oriented company.

Tools to diversify

But unlike some other high-tech companies, IBM does not use acquisitions as a tool to diversify its product families; rather, IBM buys to enhance its core businesses, Dayton says.

"In the times before, we didn't have such strong strategic linking," he says. "In the last five years, we have been very focused on our company strategy and making sure all acquisitions are tightly linked to overall corporate and business unit strategy."

Cases in point: IBM recently bought high-capacity server vendor Sequent. Dayton says IBM wanted not just Sequent's line of servers, but its extensive services organization and its Non-Uniform Memory Access (NUMA) technology. IBM will use the Sequent NUMA-Q technology and servers to round out gaps in its Unix server lineup.

Then last month, IBM purchased Mylex Corp., a Fremont, Calif., maker of RAID controllers and adapters. This move goes hand in hand with IBM's storage division's announcement of the high-end Shark storage server, Dayton says. Mylex has expertise in Fibre Channel technology, something IBM needs in order to be a credible player in the storage-area network market.

Fibre Channel should help IBM more effectively compete with EMC, some analysts say. Others don't see the move as being strategic, however.

Will Zachman, president of Canopus Research in Duxbury, Mass., says IBM's recent buyouts of Sequent and Mylex aren't a big deal, as both companies were past their prime.

"Neither one has been exactly a towering giant in the marketplace of late. These were more 'pick up the scraps' acquisitions. In terms of hot new trends, it's right up there with Compaq buying Digital," Zachman says.

Buying into SOHO

Other moves may prove more profitable, analysts say. For example, in June, IBM bought Whistle, from which IBM got a shot of Internet technology. Whistle's product is the InterJet thin-server device, which lets up to 100 users simultaneously connect to the Web and exchange e-mail. IBM expects that this product will give it a leg up in the ISP to small-office connectivity market.

While IBM usually supplies larger enterprises, the company nevertheless wants to be a leader in the plug-and-play small office/home office (SOHO) field as well, and the Whistle purchase is an important part of that strategy, Dayton says.

Companies turned blue

Some of IBM's recent acquisitions include:

Company	Acquired	Technology and assets
Internet Capital Group	1999	Services.
Mylex	1999	Storage controller and adapter equipment, Fibre Channel technology.
ONEStone	1999	Workflow software vendor, merged with Lotus.
Planetworks	1999	Enterprise middleware software provider.
Sequent	1999	High-end Intel servers, NUMA technology and services organization.
Whistle	1999	Thin servers for small office/home office Internet connectivity.
CommQuest	1998	Maker of wireless communications technology for ASICs.
Databeam and Ubique	1998	Two software firms specializing in instant messaging and real-time conferencing technology that IBM wanted for its Lotus products.
Software Artistry	1998	Maker of management technology, merged with Tivoli.
Advantis	1997	Value-added network service (later sold to AT&T).
NetObjects (majority investor)	1997	Web site development tool maker.
Unison	1997	Workload management specialist, acquired for Tivoli.

In the case of the SOHO market, IBM is probably better off buying technology there rather than trying to do it alone, says Rick Villars, an analyst at International Data Corp., a research firm in Framingham, Mass. Somewhere down the line, you may see IBM buy a directory company as well to get some expertise to add to its basic systems, Villars says.

IBM's greatest draw is its ability to implement the overall packaging and marketing of total product-consulting offerings, he says. ◪

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Briefs

MCI WorldCom has introduced a managed Web-based video and audio streaming service that organizations can use for product presentations, distance learning, sales training and other applications. Called Advanced Communications Services (ACS), the offering features one-way broadcast audio and video plus two-way text chat capability for potentially hundreds of event attendees. Presenting organizations will be charged $2,000 per event plus a fee of between 16 cents and 67 cents per minute, per remote attendee.

MCI WorldCom: www.mciworldcom.com

PSINet has completed its digital subscriber line (DSL) service trial with **Covad Communications** in Los Angeles and has rolled out the service in 21 major cities, such as Boston, New York and Los Angeles. PSINet plans to roll out its DSL service to 41 more cities in the next few months. The service costs $159 per month for 144k bit/sec.

PSINet: www.psi.net

FaceTime Communications, an application service provider in Foster City, Calif., is teaming with America Online to link its Message Exchange 3.0 electronic commerce messaging software with AOL's Instant Messenger. FaceTime offers e-merchants a customer service application hosting service, which includes archiving, reporting and analysis of customer information interactions. As a result of FaceTime's deal with AOL, customers will be able to add an Instant Messenger icon to their e-commerce Web sites that will let Web shoppers send instant messages to customer service, sales or technical support staffers.

FaceTime: www.facetime.net

Realty group slams CLEC access plans

BY DAVID ROHDE

WASHINGTON, D.C. — The real estate industry has banded together to quash a proposal that would extend government regulation of telecom services beyond carriers to commercial building owners.

As ammunition, the real estate interests have launched a broadside against the competitive local exchange carrier (CLEC) industry, claiming the new carriers can't even complete the projects for which they've contracted, so they should not need government help to gain new business.

At stake is the ability of users to gain fixed wireless bypass around local telephone companies' access lines, via antennas mounted on office buildings and linked to riser cables.

Wireless local loop companies, such as Winstar, Teligent and NextLink, say commercial building owners are making it tough because they have sweetheart deals with Bell companies and demand exorbitant fees to let them install their equipment on rooftops.

But the real estate interests say these and other CLECs are trying to get the government to subsidize their buildouts, and the companies can't even keep up with the projects they've already won. The real estate interests banded together into a group they call the Real Access Alliance to fight a proposal by the Federal Communications Commission to force them to provide rooftop access to all carriers on a "nondiscriminatory basis."

Late last month, the alliance presented the FCC with a package of affidavits from building managers around the country claiming that rollout of fixed wireless services is running behind.

"Many CLECs are still suffering growing pains and in a significant number of instances cannot provide the full range of services they are marketing, even when they have access to buildings," said lawyers for the alliance in a letter accompanying the package. The lawyers later added: "Building owners must not be made the scapegoats for economic forces entirely outside their control."

The Real Access Alliance is also throwing the carriers' own announcements back in their faces. For example, in July Winstar announced it had won access rights for more than 5,500 buildings and expected that number to rise to 8,000 by year-end. Last month, Teligent announced it had raised its year-end target for securing access rights by 20% from 5,000 to 6,000 buildings.

"People who are getting access aren't living up to the promises that they made in getting that access," says Gerry Lederer,

See **Real estate**, page 30

No consensus on access

The Fixed Wireless Communications Coalition has had problems convincing all its members that an FCC building-access mandate is the way to go.

Savvis bolsters service offerings

BY DENISE PAPPALARDO

ST. LOUIS — Savvis Communications is polishing its network and virtual private network services with an expansive global upgrade and VPN enhancements that offer business users greater geographic coverage.

Last week at NetWorld+Interop '99 Atlanta, Savvis announced that it has expanded the limits of its Internet backbone to 51 countries around the world. Savvis has linked its domestic network with that of Bridge Information Systems, Savvis' parent company's worldwide network. Savvis also introduced new quality-of-service (QoS) guarantees and dial-up support for its ProLink VPN service, which for the first time is available around the world.

Savvis was strictly a domestic service provider prior to Bridge's acquisition of the ISP in April. Bridge, a company that provides financial data to banks, commodity brokers and stock traders around the world, will share its international network with Savvis. Savvis customers can now set up VPNs that reach cities such as Jakarta, Bangkok, Auckland and Santiago (see graphic).

Savvis' international network supports transmission speeds from T-3 45M bit/sec to OC-48 2.4G bit/sec, depending on location, and is fully redundant, says Charlie Buckley, senior product manager of VPN services at Savvis.

Savvis' international presence has made it possible for the ISP to roll out dedicated VPN service — ProLink VPN was launched in June — to all 51 countries that its network reaches. ProLink VPN lets business users set up secure IP VPNs using CheckPoint Firewall-1 servers, which support encryption and user authentication. Customers can also choose from dedicated T-1 or T-3 lines, ATM or frame relay connections when setting up their VPNs.

Savvis also is in the process of beefing up its dial-up infrastructure to support its Dial-up ProLink VPN service, which the company announced last week. The ISP is deploying Lucent's Max TNT access devices around the world to support its

See **Savvis**, page 30

Savvis customers get their Bridge passports

Savvis has finished building the Network-to-Network interfaces between its domestic network and the intentional Bridge network it acquired in April, giving business users access to 51 countries around the world.

- Argentina
- Australia
- Austria
- Belgium
- Bolivia
- Brazil
- British Virgin Islands
- Caribbean Islands
- Cayman Islands
- Chile
- China
- Columbia
- Denmark
- Dominican Republic
- Ecuador
- El Salvador
- England
- Finland
- France
- Germany
- Greece
- Guatemala
- Honduras
- Hong Kong
- Ireland
- Italy
- Japan
- Korea
- Kuwait
- Luxembourg
- New Zealand
- Nicaragua
- Norway
- Panama
- Paraguay
- Peru
- Philippines
- Puerto Rico
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Savvis,
continued from page 27

Dial-up ProLink VPN Service, which starts at $45 per month, per user.

Savvis is charging a steep price for its dial-up services, says Eric Zines, senior consultant at TeleChoice, a consulting firm in Boston. Users can buy dial-up Internet access for $20 per month, but Savvis is only offering dial-up support for VPN customers. This includes client software from CheckPoint to support encryption and authentication.

Catering further to business users' needs, Savvis is rolling out Guaranteed QoS ProLink VPN service. Savvis has created four different priority levels for customers that exclusively set up their IP VPNs using ATM links, Savvis' Buckley says. The service levels include: Platinum for real-time traffic such as voice and video; Gold for business-critical data such as transaction processing; Silver for high-quality intranet or extranet data networking; and Bronze for affordable, best-effort services.

But Savvis was short on the details when it comes to the specific guarantees for each of the four levels. Buckley says that service-level agreements (SLA) for each service level will be announced in the near future. But at a minimum, all levels of service will have Savvis standard SLAs, which guarantee a minimum round-trip latency of 200 msec and a minimum packet loss of 5%.

Savvis' Guaranteed QoS ProLink VPN service can range in price from $1,200 to $45,000 per month for its Bronze service. Silver service costs 10% more, Gold is 20% more and Platinum is about 40% more, Buckley says.

Savvis: www.savvis.com

Real estate,
continued from page 27

vice president of government and industry affairs at the Building Owners and Managers Association (BOMA), which leads the Real Access Alliance.

Some supporters of the FCC proposal previously formed their own coalition to advance the interests of fixed wireless carriers. But the group, called the Fixed Wireless Communications Coalition, has had problems convincing all its members that a FCC building-access mandate is the way to go. In its filing with the FCC supporting the building-access proposal, this coalition had to admit that some of its members don't agree with the proposal and weren't participating in the comments. Those members included Bell Atlantic and BellSouth.

The Fixed Wireless Communications Coalition members that remain — including wireless equipment manufacturers such as Alcatel, Harris and Nortel Networks — say they're not asking special favors. Instead, the members say they're asking that the same principles guide interconnection of telecom networks — that everyone should have access at a similar price — should apply on rooftops and elsewhere inside buildings. ◪

More Online

- Details about the Real Access Alliance.
- Full text of the alliance's filings with the FCC.

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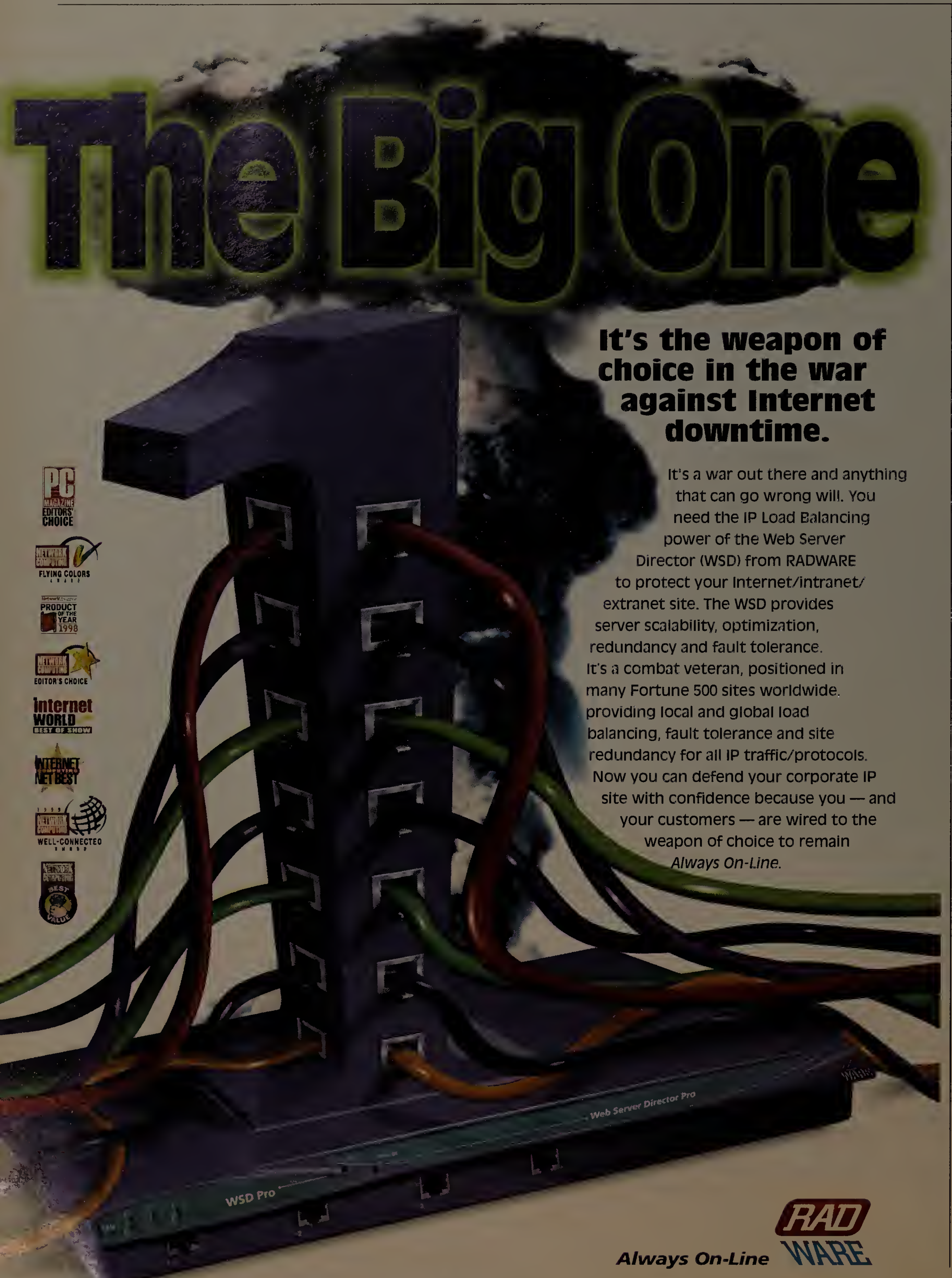
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Eye on the carriers . David Rohde

GIVE THE SATELLITE BUSINESS A CHANCE

The recent bankruptcy filing by Iridium has cast a pall on the satellite industry, particularly the new low-Earth-orbit satellite network that is designed to provide universal access around the globe.

But the market may be learning the wrong lesson from the tanking of Iridium. And users could be robbed of an important option if a negative herd mentality takes over.

Iridium provides global calling and paging over a single handset by flinging calls up to a ring of 66 satellites. The satellites hand off the call to one another until one of satellites can "see" the called party down below, conceivably halfway around the world.

Sounds cool, huh? Iridium sure thought so — and that's the problem.

Some of the commentary after the Chapter 11 filing said that Iridium was heavy on the technology but light on the marketing. I sure never found that to be the case. Last year the venture fired up its marketing machine like nobody's business. I mean, I started receiving magazines from them that were so slick they practically slid out of my hands.

And what articles! They never seemed to be about anything so grubby as making a phone call and then paying somebody money for the toll time. But I certainly learned a lot about rare species of animals in remote corners on our marvelous planet. I felt like Mutual of Omaha had been replaced by Iridium as the sponsor of TV's "Wild Kingdom."

Using this touchy-feely global hype, Iridium gathered more sales leads than it knew what to do with. You couldn't find any prices on the Web site or by calling Iridium's call center. Iridium tried passing calls to seven distributors, but their lines were often busy and their people were hopelessly devoid of knowledge if you did reach them. The few people who knew the truth — that Iridium airtime cost $3 to $7 per minute — seemed scared to say that out loud in a world of increasing cellular coverage and plummeting international prices.

The truth was that by the time Iridium launched its service after years of planning and delay, it had become dangerously close to a solution in search of a problem, unless you were on an oil rig in the middle of the ocean.

Now contrast that with the Teledesic project, which is supposed to put up an incredible 288 satellites intended for high-speed Internet access around the globe, starting in 2002 or 2003. Can you obtain high-speed mobile Internet access around the world right now? Of course not. So could Teledesic fill a market niche? At the risk of answering a question with another question, why should the capital markets penalize Teledesic just because some overpriced telephony venture couldn't get its act together?

Because two of Teledesic's biggest investors are Bill Gates and Craig McCaw, I assume the venture can take on some risk. And think about it: If Teledesic and other such projects are obsolete by 2003, it'll be because the world's telephone companies have figured out how to provide ubiquitous landline broadband data access at a fair price. Wouldn't that be nice?

Rohde is a senior editor with Network World. *He can be reached at drohde@nww.com.*

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e-business

Briefs

Sterling Commerce this week will announce an update to its remote systems management software. Connect:Manage Version 3.0 for Mobile is designed for distributing software to mobile computers that dial in over low-speed connections.

The new version checks differences between software and distributes a change to the software, rather than the whole application. The version can also detect when a mobile PC is connected over low-speed dial-up or high-speed LAN connections, and adjust its actions accordingly.

The software ships next month, with pricing starting at $5,000 for the server.

Sterling: www.sterlingcommerce.com

Banyan Worldwide Services and **Dell** have teamed to offer Exchange FastServ, a migration package for corporations moving from BeyondMail/Intelligent Messaging to Microsoft Exchange Server.

The package combines Banyan's consulting and migration tools with Dell's PowerEdge Servers. FastServ can be built using Dell's PowerEdge 1300, 2300, 4300, 4350, 6300 or 6350.

WebMethods last week introduced a business portal version of its product, WebMethods B-to-B, which corporations can use to create an XML-based vertical marketplace on the Internet for supply chain integration and automated procurement.

The new version is designed to support communication among multiple companies within an industry. It also translates between disparate electronic commerce applications. Pricing starts at $100,000.

WebMethods: www.webmethods.com

Sun takes up office apps crusade

Microsoft rival says the server is the best place to run productivity tools.

BY JOHN FONTANA

ANALYSIS *CAMBRIDGE, MASS.* — While Sun has taken over for Lotus as the lead advocate for prying office productivity applications off users' desktops and putting them on servers, it's still unclear whether IT executives will buy into the concept.

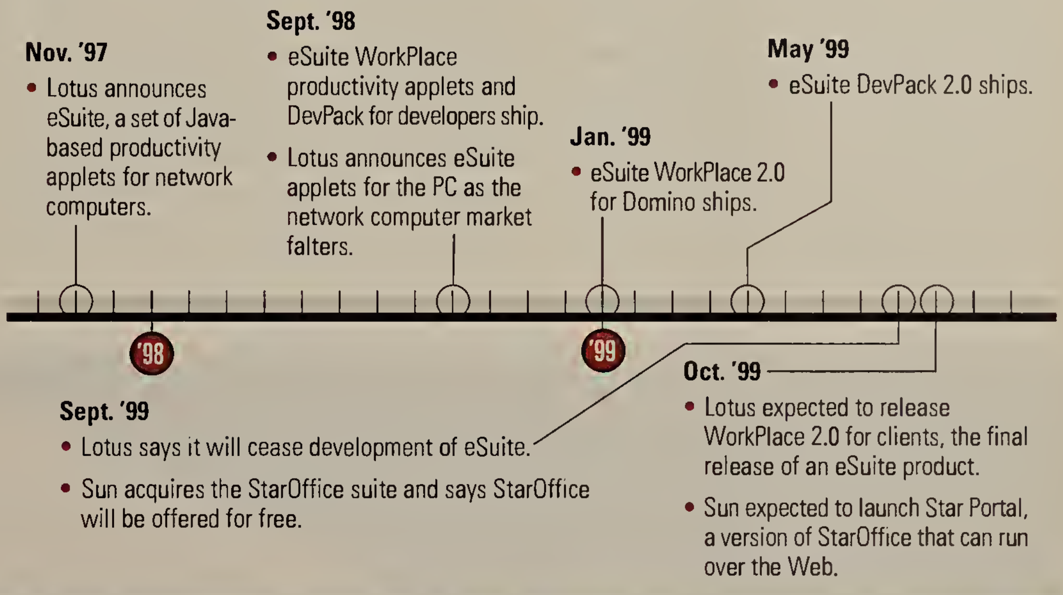
Some users say they are not ready to move the applications, which include word processing and spreadsheets, off user desktops. But analysts say the emerging application service provider (ASP) market will change that thinking.

Sun agrees with the analysts and has launched an ambitious plan — including free software — in an effort to infiltrate the office productivity applications market and jump-start the server-based and hosted applications markets. But Sun is targeting an office productivity software

See **eSuite**, page 36

Passing the torch

Beginning with the hype over the network computer, vendors have been saying that office productivity applications should be run from a server instead of a client. Lotus was the first to advocate the change with its eSuite product, but now that eSuite has failed, Sun is taking up the charge.



Nov. '97
- Lotus announces eSuite, a set of Java-based productivity applets for network computers.

Sept. '98
- eSuite WorkPlace productivity applets and DevPack for developers ship.
- Lotus announces eSuite applets for the PC as the network computer market falters.

Jan. '99
- eSuite WorkPlace 2.0 for Domino ships.

May '99
- eSuite DevPack 2.0 ships.

Sept. '99
- Lotus says it will cease development of eSuite.
- Sun acquires the StarOffice suite and says StarOffice will be offered for free.

Oct. '99
- Lotus expected to release WorkPlace 2.0 for clients, the final release of an eSuite product.
- Sun expected to launch Star Portal, a version of StarOffice that can run over the Web.

Start-up offers document management over the Web

BY CAROLYN DUFFY MARSAN

NetDocuments, a new provider of Web-based document sharing services, later this year will offer a service for intranets and extranets through a partnership with Epicentric, which provides a turnkey corporate portal product. Enterprise customers will be able to control and co-brand the consumer-oriented NetDocuments' service through Epicentric, which also offers customized news, weather, stock reports and other Internet services.

Enterprise customers want "to be able to determine which Internet services they allow employees to use," says Oliver Mouto, vice president of marketing and co-founder of San Francisco-based Epicentric. "The portal has emerged as a very appropriate mechanism by which they can do that."

Mouto says Epicentric's enterprise customers, which include the U.S. Postal Service, asked for document sharing, which led to the partnership with NetDocuments in Orem, Utah. Support for NetDocuments will ship in Epicentric's standard product by year-end.

Nancy Meachim, research director of e-business at Aberdeen Group in Boston, says NetDocuments addresses two key concerns for enterprise customers: document security and IT development costs. By storing documents in the electronic equivalent of a bank vault, NetDocuments alleviates worries about hackers viewing sensitive information. And for organizations without document management applications, NetDocuments "gets you there faster and cheaper, and you're not depending on your own IT department to put in a system or maintain it," she says.

More Online

FIND IT ON FUSION

DocFinder 4725

- A FAQ about the NetDocuments service.
- Information about Xerox PARC's document banks project.

www.nwfusion.com

Launched last week, NetDocuments is the brainchild of the team of developers that created SoftSolutions, a LAN-based document management package now bundled in Novell's GroupWise.

The basic NetDocuments service is free to end users, who can store 10M bytes of data at a commercial bank data center with audited security. The free service includes synchronization of document changes, e-mail notification of changes, tracking of document status, secure document delivery and encryption. A premium service, which costs $4.95 per month, allows up to 100M bytes of data storage and provides document backup and recovery services, certificate-based digital signatures and shared workgroups. A Web browser is needed to access the service.

The ease of use and low price of the service is what attracted Lomesh Shah, a training consultant at MetLife Financial Services. Shah's workgroup is using the service to share sales presentations and reports. "This service lets everybody on the team have access to the most recent version of the document," Shah says.

NetDocuments: www.netdocuments.com; Epicentric: www.epicentric.com

eSuite,
continued from page 35

market dominated by bitter rival Microsoft, whose Office suite boasts nearly a 90% market share.

Ironically, Sun's effort comes on the heels of Lotus' acknowledgement that its three-year development of its Java-based eSuite has been terminated. The eSuite applications are a set of slimmed-down productivity applets intended to run on network computers and PCs. Observers say eSuite failed because the network computer flopped and the applications weren't full-featured.

Sun is swooping in with its StarOffice applications, including a word processor, spreadsheet, graphics package, calendar and other software. The desktop-based StarOffice is free, and next month, Sun will begin beta tests of StarPortal, a componentized server version of StarOffice that can be accessed through a Web browser. Sun believes the components will spark the ASP market, which International Data Corp. predicts will grow to $2 billion by 2003.

But the fact remains that most users are not ready to shift office applications from the desktop to the server.

Sun's Croll says there's a market for server-based applications.

"I don't see a lot of reason to move office apps off the desktop," says John Masseria, manager of system support for Carnival Cruise Lines and a user of Microsoft's Office. "For Oracle Financials or SAP applications, there is a lot to be said about the server. There I don't have to worry about updating client code for things like database changes." Masseria says his Office applications only change when new service packs arrive, and it's just as well to run applications on desktops given the plunging cost of desktop computing power, he says.

"Corporate IT will pass these server-based apps by like the plague over the next three years," says Tom Austin, an analyst with the Gartner Group. But Austin believes such applications will eventually be part of a corporate Webtop in which programs are accessed via the Web.

Other users are proving that office application components have appeal as part of larger server-based Web applications but doubt the stand-alone applications will move to the server.

"Sun's move is Round 2 of the network computer — maybe we should call it network business," says Randy Eckel, chief operating officer of InfoImage, who ran eSuite components as part of analytical applications on his Freedom portal. "But what is Sun going to do to make it work that Lotus did not?"

Sun claims there is a shift in the way applications are delivered.

"The business trend is on software as a service, not as a shrink-wrapped product," says Brian Croll, senior director of Sun Software's product and platform division. Croll says e-mail, calendaring and contact applications are offered over the Web, so why not other applications? He says Lotus' business model was incorrect.

"It's not just the software, you need to offer the source code and binary for free," he says. "The value is offering a service to IT, not delivering software."

Some analysts agree that IT executives are ripe to move their companies' applications to the server.

"If users can get to the applications when they need them and with the performance they expect, they will use them," says Amy Wohl, president of Wohl and Associates.

Wohl says enterprises may find the StarOffice applications interesting. "They will get more componentized over time and may be offered like tiered-services in the cable world," she says.

Such a concept is appealing enough to attract Microsoft. Company President Steve Ballmer two weeks ago reiterated that Microsoft is considering offering a hosted version of its Office product.

If that happens, Sun will not only have to wrestle Office off the desktop, but it will also have to beat Microsoft at its own game on the server.

The battle, however, will only play out if IT executives ring the opening bell and demand server-based office applications. So far, that bell has been pretty silent. ◪

Start-up brings the Web to factory floors

BY ELLEN MESSMER

PROFILE: DATASWEEP

START-UP COMPANY

Headquarters:	San Jose
Founded:	1998
Founder:	Vladimir Preysman
Product:	Advantage, Java software for tracking factory-floor production data in real time
Funding:	$2 million from Mohr Davidow Ventures, $12 million from Accel Partners
Number of employees:	25

SAN JOSE — On the typical high-tech factory floor, a combination of human workers and automated machine tools are busy turning out complex equipment for buyers in the network, medical and other industries.

But keeping track of exactly what's going on has largely been done through paper-based tracking of units built on the shop floor, making it difficult to check the order status or push through order changes at the last minute on customized equipment. To address this problem, start-up Datasweep last week unveiled a Web application called Advantage that keeps track of factory activity in real time and gives buyers, resellers, parts suppliers and the manufacturer a view of it all via any Java-based browser.

"As manufactured units become customized, and manufacturing time needs to be closely synchronized with shipping time, equipment buyers want to know whether change orders can be taken in time," says Datasweep founder Vladimir Preysman, a systems engineer whose background includes stints in manufacturing at KLA-Tencor, Hewlett-Packard and Kodak.

Datasweep's software runs on a Windows NT server. The software collects production information from factory floor computers via agent programs and taps into back-end enterprise resource planning systems that hold customer order information. Datasweep's software synthesizes all the information and makes it available to end users with Web browsers.

Datasweep based its software on NT partly because Microsoft is making inroads into the factory floor with its network operating system, Preysman says. Advantage uses the Distributed Common Object Model and ActiveX Controls to communicate with factory-floor applications.

Advantage also uses the Microsoft SQL Server 7.0 database to store production information, with support for Oracle8 anticipated in future releases. Advantage also ships with a second online transaction processing database that takes production information, analyzes it and readies reports that include the history of each unit and other data.

A handful of manufacturers are already using Advantage, including Flextronics, Harmonic, Intuitive Surgical and Acma Computers. Acma President Allen Lee says Web-based factory-floor production tracking, in use at his company since March, has helped boost on-time delivery of the computer systems Acma assembles.

Acma plans to give a number of its largest customers a Web-based view of production status in the near future in order to reduce the number of service calls that Acma sales staffers typically handle regarding factory production.

Although the Advantage application doesn't yet let users input order changes directly into automated machine tools, that is a feature Datasweep plans to work on for the future.

A typical configuration will cost about $80,000, the company says.

Datasweep: www.datasweep.com

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'Net Insider . Scott Bradner

WHERE NOW FOR THE IETF STANDARDS PROCESS?

A reporter interviewed me last week for a publication that covers the traditional telephony world.

One of the questions I was asked went along the lines of: "Now that the Internet has become so important to the world's economy and with all the convergence with the telephone world, is it time to move away from the informal Internet Engineering Task Force (IETF) standards process and to a more traditional one?" I had the feeling of being caught in a time warp. Where had this reporter been the past dozen years?

I think the first time I heard a question like that was in the late 1980s. It seems that, in the parlance of the time, some people "just don't get it."

But the Internet's high profile means that more and more people who don't get it and are in positions of authority in corporations or governments are trying to make the future more predictable by attempting to control the Internet and the organizations, such as the IETF, that have helped create it.

By one measure, the Internet is 30 years old this month. It was 30 years ago that the first ARPANet nodes were installed. But for most people, the Internet is still a youth whose explosive growth started with the introduction of the Web in the mid-1990s.

Almost all of the Internet pioneers — with the major exception of Jon Postel, who died about a year ago — are still with us and contributing. (Those readers with mbone access can listen to a recording of the "History of the Internet" tutorial given a few weeks ago at Harvard at http://iec-archive.caida.org/SIGCOMM99/.)

IETF still leads the charge

The IETF (www.ietf.org) is still very active and on the forefront of Internet development, and I expect that to be the case for the foreseeable future. But there is a galaxy of other groups — some old, most new — that is trying to get into the Internet standards game. A few of the new ones seem to be reacting purely to the uncertainty of what will come out of the standards process. The businesses don't think they can control this.

It seems that far too many of these worriers forget that it's employees of high-tech companies, including service providers, that drive the IETF, and they are not out to disrupt the economic boom that the Internet has brought.

I expect there will be some significant tension in the future between the IETF and those organizations and governments that would like to moderate progress. I hope that the IETF can figure out how to deal with them in spite of the group's almost libertarian impulse to tell others where to go.

Disclaimer: Harvard's vocabulary may make it hard to notice when the university tells you where to go, but the above scribble is mine alone.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

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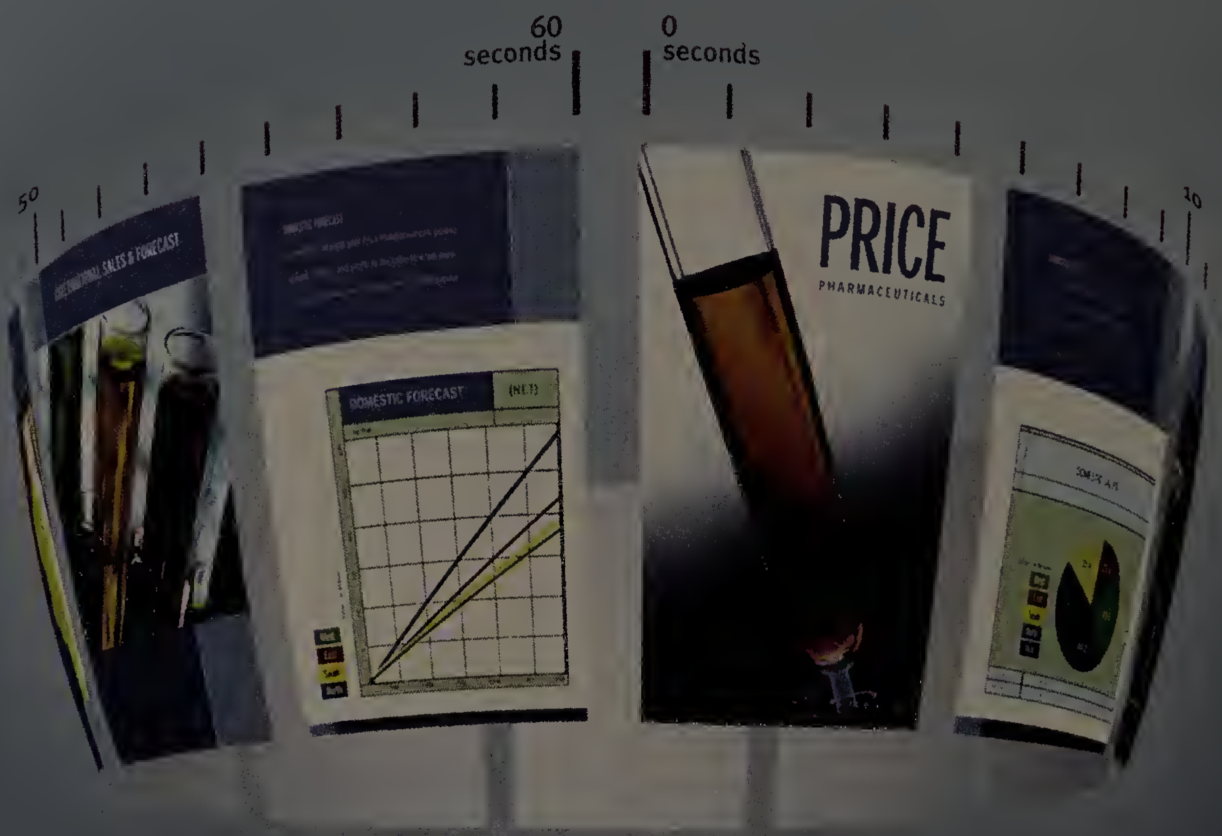

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Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Ask Dr. Intranet

By Steve Blass

Our organization has a small peer-to-peer network on the Windows 98 platform running Office 2000. We are not connected to the Internet, but would like to have interoffice e-mail. I am having difficulty setting this up. Do I need Exchange server or some other third-party program, or can Microsoft Mail handle it?

Via the Internet

Microsoft Mail doesn't come with 98 or Office 2000. You will need Exchange, the supported Microsoft mail server, or some third-party program. Alternatives for providing Internet-style e-mail services include:

- Use of a Linux server. Most Linux distributions come with all the software you need.
- Use of sendmail for NT, which includes Post Office Protocol (POP) server capabilities.
- Use of JNOS, an MS-DOS program that can turn any old 80 by 86 PC into a TCP/IP mail server. JNOS is available from http://139.174.253.13/pub/ham-radio/tcpip/jnos.
- Use of a sendmail-compatible Perl module that runs under Windows. It is available from www.macgyver.org/software/perl.

You will need to identify or install a system to use for your mail server, decide which client software you want employees to use and ensure the client software can communicate with the server. Microsoft Exchange server with Outlook clients will work. A Linux server will serve Outlook clients configured to use a POP mail server, but your peer-to-peer net will need to handle TCP/IP.

Blass is a network architect at Sprint Paranet in Houston. You can reach him at drintranet@paranet.

Shrinking card technology down to size

BY KIP MEACHAM

An emerging standard will soon help computer designers put integrated network functions into smaller spaces than ever before and will give laptop users easier access to new communications technologies.

Chartered by the PCI Special Interest Group in 1998, the Mini PCI specification defines an internal interface card — smaller than a standard business card and as thin as 5mm — with features equivalent to a standard PCI expansion card.

Mini PCI is targeted initially at modems, network interface cards (NIC) and combinations of the two. It will give system designers a standard footprint — actually, three specific form factors — within which they can place the network I/O functions of next-generation laptops and other devices.

Also, Mini PCI will make product selection easier for network managers charged with ordering and installing laptop computers for their companies' telecommuters and other mobile users. Traditionally, net managers have had to take whatever modems or NICs their suppliers offered and were reluctant to go to custom configurations for large orders.

The standard will make it possible for net managers to order precisely the communications options their users want. And as new communications technologies, such as cell phone adapters, ISDN, digital subscriber line and cable modems, become integrated in laptops, users of Mini PCI machines will be able to migrate quickly, through relatively simple field upgrades.

PCI electronics

Mini PCI uses essentially the same electronics, PCI signals and software drivers as a standard PCI expansion card and behaves in the system like a PCI Version 2.2-compliant peripheral. As in the PCI Local Bus Specification, Mini PCI uses a 32-bit data path to optimize performance in contemporary 32-bit systems.

The current PCI standard, the Mini PCI specification calls for power management as outlined in the PCI Power Management Version 1.1 specification, and adds requirements specifically for power-conscious notebook system designs.

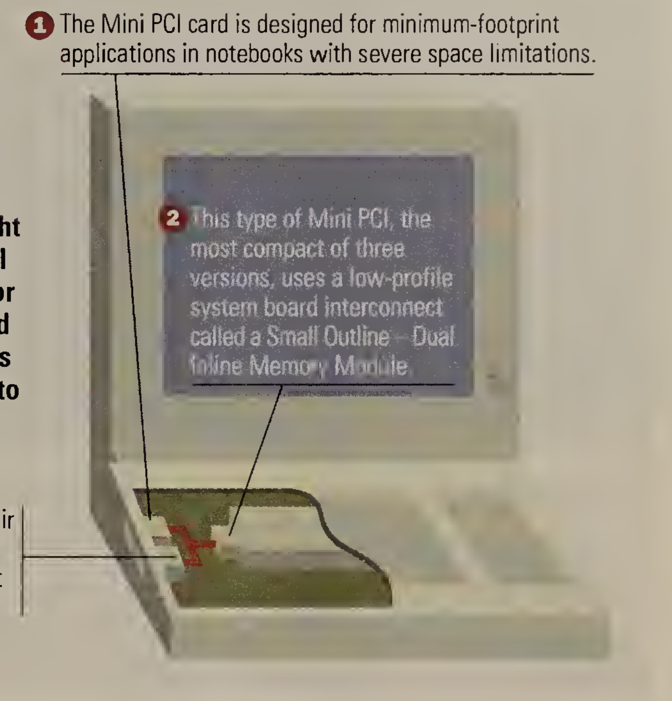
Unlike the PCI standard, however, Mini PCI is focused on communications. Because of this, it includes buses and signals that are not part of the PCI standard to support audio, modem tip and ring, and LAN I/O functions.

The most visible difference between PCI and Mini PCI involves packaging and size. Because Mini PCI is internally mounted, extra packaging — the PC Card frame for removable cards and its associated cover and trim — is eliminated. Also, Mini PCI is about one-half to two-thirds the size of typical PC Card devices. This compact design makes it possible for laptops to integrate Mini PCI devices and still accommodate the conventional PC Card slot for expansion and other functions.

UP CLOSE

An inside look at a Mini PCI card

Designed to cram PCI capabilities into extremely tight spaces, the emerging Mini PCI specification will be a boon for designers of PC notebooks and other small devices, as well as network managers who need to outfit their company's road warriors.



① The Mini PCI card is designed for minimum-footprint applications in notebooks with severe space limitations.
② This type of Mini PCI, the most compact of three versions, uses a low-profile system board interconnect called a Small Outline – Dual Inline Memory Module.
③ The Mini PCI card uses twisted-pair or flex-circuit cables to get to the modem and LAN I/O connectors at the edge of the notebook chassis.

Each form factor specifies certain "regions" on the card for system connectors, modem I/O and LAN I/O cable headers or connectors, with the remainder of the board area available for the functional design. Importantly, the standard additionally sets aside a region for alternate I/O connections that might accommodate future applications, such as cellular connections, ISDN and other nonstandard communications functions.

The Mini PCI standard promises to make users happy by speeding delivery times from laptop vendors because the vendors will be able to employ build-to-order/configure-to-order techniques to vary modem or NIC configurations even within the same computer model. Also, users and network managers will find upkeep simplified, thanks to the fact that the standard permits field maintenance as well as field upgrade.

Users can expect Mini PCI-enabled systems to turn up soon. The specification's production release Version 1.0 is set for the second half of 1999.

Member companies of the Mini PCI Working Group include 3Com, AMD, AMP, Compaq, Conexant, Dell, Gateway, Hitachi, IBM, Intel, Lucent, Micron, Mobility Electronics, Molex, Sony, Toshiba, Texas Instruments and Xircom.

Meacham administers the Mini PCI Specification in the Mini PCI Working Group and is new-market development manager in the OEM Products Division at 3Com. He can be reached at kip_meacham@3com.com.

Let Network World provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Paul McNamara at (508) 820-7471 or pmcnamara@nww.com

Gearhead — inside the network machine . **Mark Gibbs**

WOW! TO THE POINT WITH ANYPOINT

Ever had to network a PC in some odd place that precludes running things like 10Base-T cable? When confronted with that dilemma, there are several technologies to which you can turn. The top-end wireless products are great because they have good range and excellent throughput. Unfortunately, they are also pricey. (Gearhead favors RadioLAN, which we may cover in a future column.)

The less-expensive wireless products generally seem to have limited range and poor throughput, so what are the alternatives?

Gearhead has the pleasure of living in a house built in 1920. It is remarkable for many reasons, including the lath and plaster walls that are hard as rock. This makes putting in new 10Base-anything a little tricky.

So to get Gearhead's wife's computer in another part of the house connected to the office network required a different approach. Gearhead tried a couple of powerline products, but they didn't work, probably because of the antique wiring.

The wiring in most of the house is something called "knob and tube," an old technique that has the live and neutral lines completely separated (that is, they are spaced about four inches apart). The lines are held in place with ceramic knobs and run through joists in ceramic tubes. It may well have been the odd electrical characteristics of the knob and tube system that defeated the powerline products.

In the end, Gearhead settled on the Intel AnyPoint Home Network system (www.intel.com/anypoint). This product transfers data at a nominal 1M bit/sec and uses the telephone lines in your house as its medium. It can also share the line with both voice traffic and even digital subscriber line (DSL) service. Intel claims AnyPoint can support up to five or six PCs.

The AnyPoint Home Network is compliant with the Home Phoneline Networking Alliance (HPNA at www.homepna.org) specification for phoneline networking and operates in the 5.5-MHz to 9.5-MHz frequency range, as compared to voice traffic that is between 20 Hz and 3.4 KHz, and DSL, which operates in the range of 25 KHz to 582 KHz.

The HPNA standard uses a modified version of 802.3 Ethernet frames. You'll find a brief description of the standard at www.intel.com/anypoint/how/phtech.pdf (note that Intel has committed the sin of using Portable Definition Format unnecessarily — the PDF file is just under 135K bytes for a document of just eight pages, for heaven's sake).

Anyway, because the wife's remote PC is not easily expandable — it is an oldish Monorail machine — Gearhead decided to use the parallel interface version of AnyPoint, a strange 2001-style obelisk that plugs in to the parallel port and, in turn, has a port for the printer. Gearhead used the PCI-card version of the product in the server in the office.

Installation of the hardware was a nonevent, as was software installation on the Monorail running Windows 95. However, the server was running Windows 98 and immediately on start-up asked for a driver for some unspecified hardware (we'd already installed the AnyPoint software). When told to cancel, the server entered an endless loop asking over and over again for the driver (who was the raving lunatic who designed Microsoft's Plug-n-Play architecture?). Eventually this problem was overcome (just prior to reprogramming the PC with an axe).

The product comes with software to enable sharing of Internet services on the server machine. This service worked flawlessly, although it is very curious to find that your PC is directly sharing the address space and TCP/IP services of the server machine.

The bottom line is "Wow!" It works as advertised. It is simple (Windows 98 not withstanding), performs well and, at roughly $100 per node, is reasonably inexpensive. Intel's AnyPoint Home Network gets nine gear teeth out of ten. Gearhead now has a happy wife.

Drop a line of data to gb@gibbs.com

NetworkWorld Fusion Spotlight

News, tips and tools from our Web site

Convergence, anyone?

Convergence was a big topic at last week's NetWorld+Interop '99 Atlanta — even if every vendor did seem to have a different definition of just what it means to combine voice and data on a single network. Come online for a series of reports, from breaking convergence news to our very own convergence showdown (in which big vendors such as Cisco, Lucent and Nortel Networks battled it out). Plus, use our convergence scorecard to see how ready you are to blend your voice and data nets. Answer some questions, then get a convergence readiness score.

DocFinder: 4730

QoS? No thanks

Speaking of convergence, a key part of a successful single voice/data network is quality of service (QoS). Or is it? TCP/IP by itself doesn't give you any way to prioritize traffic or monitor how well your network is meeting service promises to your customers. But James Wiedel, director of networking at the University of Southern California (20,000 nodes strong), says it's simply a lot easier and less expensive to throw more bandwidth at the problem — sometimes even on the WAN. And that approach avoids all the political problems that come with trying to prioritize traffic, he says. Read his arguments — and some counterarguments from QoS vendors.

DocFinder: 4731

NetWorld+Interop

Were you there? Did you get out ahead of the hurricane? What were your impressions (of the show, that is)? What did you find intriguing, useful or just plain silly? Discuss it in our N+I Notes forum, where you'll find some of the things that struck us about the annual Atlanta event.

DocFinder: 4732

A big stink

One Fusion user recounts a horror story that involves building a wiring closet atop a septic tank that was close to overflowing. Another recalls the amazing havoc caused by forgetting to hit the enter key. Read their tales of woe, then add your own to our network horror stories forum.

DocFinder: 4733

Newsletters

Join Sandra Gittlen for a free, twice-weekly lesson in setting up shop online. Her newsletter on e-commerce for the enterprise will give you the kinds of tips and news you need to help craft a successful electronic commerce strategy. If you're interested in directories, check out Dave Kearns' new newsletter on that topic.

DocFinder: 4734

Daily security news

Network World Security Alert is your daily dispatch from the security front. Each weekday, you'll find links to information on the latest security holes, patches and products from *Network World*, the IDG News Service and key security and application vendors (you'll also find a link to the archive of our Security newsletter).

DocFinder: 4735

Help Desk

Ron Nutter is standing by to answer your network questions. Read his column every week on Fusion. DocFinder: 2450

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*Price shown refers to U.S. estimated selling price for the Armada M700 (part number 149207-002). [illegible] transfer rates may vary from 150 KB/s to 3600 KB/s. Operating system installed. Intel, the Intel Inside [illegible] Compaq, the Compaq logo and Armada are registered trademarks and Better answers is a service [illegible]

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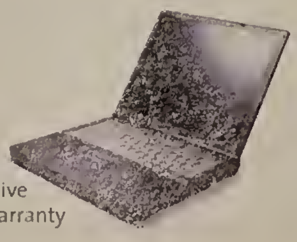

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Editorial Insights

Effort underway for a new wireless LAN standard

One of the things that bubbled to the surface last week at NetWorld+Interop '99 Atlanta was a new standard for 54M bit/sec wireless LANs.

Actually, it wasn't the launch of the standard, but the announcement of a forum that has taken it upon itself to promote the standard, called HiperLan/2.

Founding members of the HiperLan/2 Global Forum (H2GF) include Bosch, Dell, Ericsson, Nokia, Telia and Texas Instruments. The standard is being developed in the European Telecommunications Standards Institute's (ETSI) Broadband Radio Access Networks project.

I admit I was skeptical. First, the only LAN standards I know are IEEE, not ETSI. Second, the IEEE already has a handful of wireless LAN standards, including one for 54M bit/sec LANs called 802.11a. And third, none of the companies promoting H2 are known LAN leaders. But I now think there might be something to this.

The basic pitch goes like this: H2 would operate in the 5-GHz range of radio frequencies — which are already set aside for unlicensed datacom use in the U.S., Europe and Japan — and deliver 54M bit/sec at the physical layer and 25M bit/sec at Layer 3 (this bandwidth is shared among users in a given cell). Unlike the IEEE standards, H2 would be a connection-oriented technology, which makes it rather easy to implement support for quality of service (QoS). It would also work with multiple types of fixed nets, such as Ethernet, ATM and FireWire, whereas the IEEE wireless standards all rely on Ethernet as the medium for connecting base stations.

Besides promoting the standard and trying to win over other supporters, H2GF will be responsible for performing interoperability tests to ensure that H2 products are truly compatible. The standard is supposed to be finalized by year-end, with products emerging in 2001.

Noble goals, but will H2 fly?

It just might because of the support for QoS. As we begin to converge voice and data on fixed networks, we are going to need a tool to migrate the same feature set to wireless terminals, which means we'll need a way to prioritize use of those precious airwaves.

But the last thing we need is multiple standards. If H2 is going to see the light of day, we need IEEE 802.11a backers and H2GF to consolidate their work. And we need wireless LAN leaders to bless the effort by joining H2GF.

— John Dix
Editor in Chief
jdix@nww.com

Message Queue

DISSATISFIED CUSTOMER

Regarding Linda Musthaler's column "With a new CEO in place, it's back to business at Compaq" (Aug. 9, page 39):

My unfortunate experience with a Compaq Presario Model 2266 and Compaq's response to my complaints leaves me unable to see how new CEO Michael Capellas can turn the company around, given that Compaq seems unfamiliar with the phrase: "Customer satisfaction guaranteed or your money back."

Starting from the first day I took the Presario home and plugged it in, I have had nothing but problems with the hardware and software. Because I purchased the computer at CompUSA in Towson, Md., I requested that the store either give me a new one that works or my money back. They told me they would repair any mechanical part without charge because the machine was under warranty, but I would have to pay them to fix any software problems. When I protested, I was told to take my case to the manufacturer, so I wrote to Capellas. His reaction was to turn the problem over to #26 Sales Service Person. This individual called me to say she had warned me that my letter to Capellas would immediately be sent to her to acknowledge, and furthermore, there was no way they would replace my computer or give me my money back.

I have since learned that Compaq has been having problems with the Presario, which seems to verify that I received a lemon, and I am more determined that ever to get satisfaction. However, I wouldn't bet money that Capellas will turn this situation around.

John Quinn
President
Quintech Communications
Owings Mills, Md.

Musthaler replies: In response to the column about Compaq, I received several letters from readers like Quinn who experienced unpleasant service encounters through Compaq-authorized agencies. In each case, these readers were individual consumers (representing themselves, not a corporate buyer). While my column was intended for corporate buyers, I do not advocate any manufacturer or its representatives turning their backs on any customer, even the little guy — the consumer.

I turned over each complaint I received to the office of Compaq's newly appointed vice president of quality and customer satisfaction, Bo McBee. He is the customer's advocate within Compaq. This new position was created under Capellas' direction and reports directly to him.

McBee's office promised action on each case and has already resolved one to the customer's satisfaction. I encourage readers to contact McBee directly at Bo.McBee@compaq.com if they experience quality or customer satisfaction issues with Compaq. If Compaq and Capellas are serious about their commitment to customers, they will ensure satisfaction from the largest customer on down to the home user.

Further, I encourage other hardware and software manufacturers to publicize their contact information for customer satisfaction issues.

OVERSIGHT NOTED

I noticed what may be an oversight or oversimplification in Mark Gibbs' "Gearhead" column "A guide to the Common Gateway Interface" (Aug. 30, page 48). Gibbs states that the Web server does not receive its name when a URL is sent. This is not true. In Apache, for instance, virtual domains are handled by treating each request differently based on the server to which it is addressed.

For example, "www.domain1.com" and "www.domain2.com" may reside on a single server with a single IP address running a single daemon on Port 80. However, different content will be served based on the URL used.

Shea Lovan
Vice president
Porpoise Network
Santa Barbara, Calif.

Gibbs replies: You are correct as long as all clients use HTTP 1.1, which was not the case for browsers up to Version 3. I oversimplified and indeed will probably write a column exploring the mechanisms of CGI in more depth.

Send letters to nwnews@nww.com or John Gallant, editorial director, Network World, *161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.*

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Venture Over the Horizon . Kevin Fong

DSL MEETS DIAL TONE: THE NEXT COMMUNICATIONS REVOLUTION

Nothing is more appealing to the average person than getting something for nothing. This has certainly been a driving force behind voice over IP. The current flat-rate pricing for unlimited access does away with the metered charges of traditional phone service and results in virtually free telephone calls.

In fact, the real benefit of voice over IP within an enterprise is not low-priced telephone calls but rather the efficiencies that can be gained from a converged data and telephony infrastructure. There is another way to achieve convergence that is a lot easier to implement than voice over IP now reaching the market: voice over digital subscriber line (DSL).

DSL is a way of delivering broadband data that fits nicely between inexpensive-but-slow analog dial-up services and expensive-but-fast T-1 services. Now vendors are ready to exploit another important feature of DSL: the ability to enable up to 16 voice telephone lines as well as high-speed Internet access using a single DSL connection.

Several venture-backed companies, including Accelerated Networks, CopperCom, Jetstream, Sylantro and TollBridge Technologies, have begun to offer voice-over-DSL products. Jetstream, in which Mayfield Fund has an investment, currently is delivering a voice-over-DSL product in conjunction with Cabletron subsidiary FlowPoint. FlowPoint offers integrated access devices (IAD) that are compliant with Jetstream's multiservice access network architecture. FlowPoint's IAD will reside at a subscriber's premises, connect to a DSL circuit and deliver up to 12 standard telephone lines as well as continuous high-speed Internet and remote LAN services over a single copper pair.

Start-ups are not the only ones interested in the voice-over-DSL market. Lucent recently announced a voice-over-DSL product that combines its PathStar portfolio of IP-based, multiservice central office products and MultiDSL access concentrators with Copper Mountain Networks' CopperEdge DSL concentrators and packet-based IADs. This product promises to deliver eight or more telephone lines and high-speed data services over a single unbundled local loop.

While voice over DSL is currently being aimed at households with multiple telephone lines and small to midsize businesses, it does have implications for large enterprises. Voice over DSL offers a highly cost-effective way to connect branch offices and teleworkers to the enterprise. In the case of branch offices, just four analog phone lines could yield enough carrying capacity for at least 24 simultaneous telephone calls and still leave plenty for high-speed Internet access.

For network managers who need to support a decentralized work force, voice over DSL looks to be the most cost-effective way to go.

Fong is a general partner of Mayfield Fund, a venture capital firm in Menlo Park, Calif. He can be reached at kfong@mayfield.com.

Reality Check . Thomas Nolle

XML: A TECHNOLOGY THAT'S REALLY AT YOUR SERVICE

If you've read anything about the evolution of the Internet, you know that XML is the successor to HTML as the lingua franca of the Web. You know Microsoft supports XML in Internet Explorer 5.0. You may even know that XML can be used to provide data portability among applications.

But did you know XML might help you call your mom? Did you know it could define your virtual private networks (VPN)? Vendors are now saying you can use XML to do both these things.

XML replaces the idea of services being a part of big switches with the concept of a flexible set of service definitions that can be read by every device involved in creating and using a service. A service can be defined in an XML page that links to other XML pages in order to define features. Each feature XML page can define "behaviors" for each of the devices in the network that participate in creating or delivering that feature. The user, by modifying an access-to-service page, can define how a particular feature is requested or delivered.

The cooperative signaling that occurs in voice call forwarding or VPN server load balancing can also be defined in XML. The old, rigid Signaling System 7 approach is replaced by what we could call "SSX," a signaling system based on XML definitions. Each service message (including billing instructions) can be designed as an XML page and the structure definition stored where everyone who will need to read the signals can find it.

But for most of us, XML's greatest impact may be how it controls user-to-network relationships. With simple XML authoring tools now becoming widely available, users could change service profiles easily, deciding what code they want to dial for last-number-redial service or redefining just what kind of traffic is allowed onto a VPN.

Behaviors that affect a single user, such as how voice mail and e-mail relate to each other, could be created by users themselves or by service providers, developers and equipment vendors, with users picking the behaviors they like. Sound wild? Well, vendors are already offering this very thing.

The action started in the voice market. DTI, a provider of Class 5 switches, has announced call feature management using IP/Internet resources via what DTI calls Call Policy Markup Language (CPML). The company jokingly calls its approach "voice under IP" to reflect IP's role in feature delivery and coordination, rather than transportation.

Other vendors are giving chase. Newcomer ipVerse has announced an XML-based services architecture that would let service providers create custom features for users and also permit users to tune feature behavior to suit their business. Convergent Networks, a new-generation voice player, has announced that XML will provide some of the flexibility in its Service Enabling Architecture.

In the data VPN market, Abatis Networks announced an XML-based Service Definition Language to control how VPNs work. Features include control over customer access, quality of service and even the relationship between users and application service providers. LAN vendor Top Layer Networks announced it has adopted Manage.Com's XML-based problem management software. Cornice Communications, which plans to use XML as the basis for a far-reaching service brokerage architecture that would embrace data or voice, premises or service provider, is still being coy about product details, but it may have the most ambitious scheme of all.

But the XML story that users can apply most directly comes from Merlot Communications. Merlot offers the first voice-over-LAN architecture to be based on XML, via a definition it calls ServicePage. With this architecture, users can create custom LAN PBX features, control dial sequences used to trigger features and even link sites in a kind of cooperative Centrex. Merlot also says it will support service provider XML linkage and even sell its products through service providers as a kind of super-Centrex.

Of course, there are still issues to face. The use of common feature definitions doesn't guarantee interoperability; a standard service model is needed. Security must also be provided for the XML features. All these issues will surely be debated, and some of the benefits of XML-based services may be delayed. But at least debates about features make more sense than debates about convergence of technologies as an impetus to future network trends.

A features debate is exactly what XML will give us. By emphasizing service rather than technology, XML is forcing the market to focus on what service providers should have been focusing on all along.

Nolle is president of CIMI Corp., a technology assessment firm in Voorhees, N.J. He can be reached at (856) 753-0004 or tnolle@cimicorp.com.

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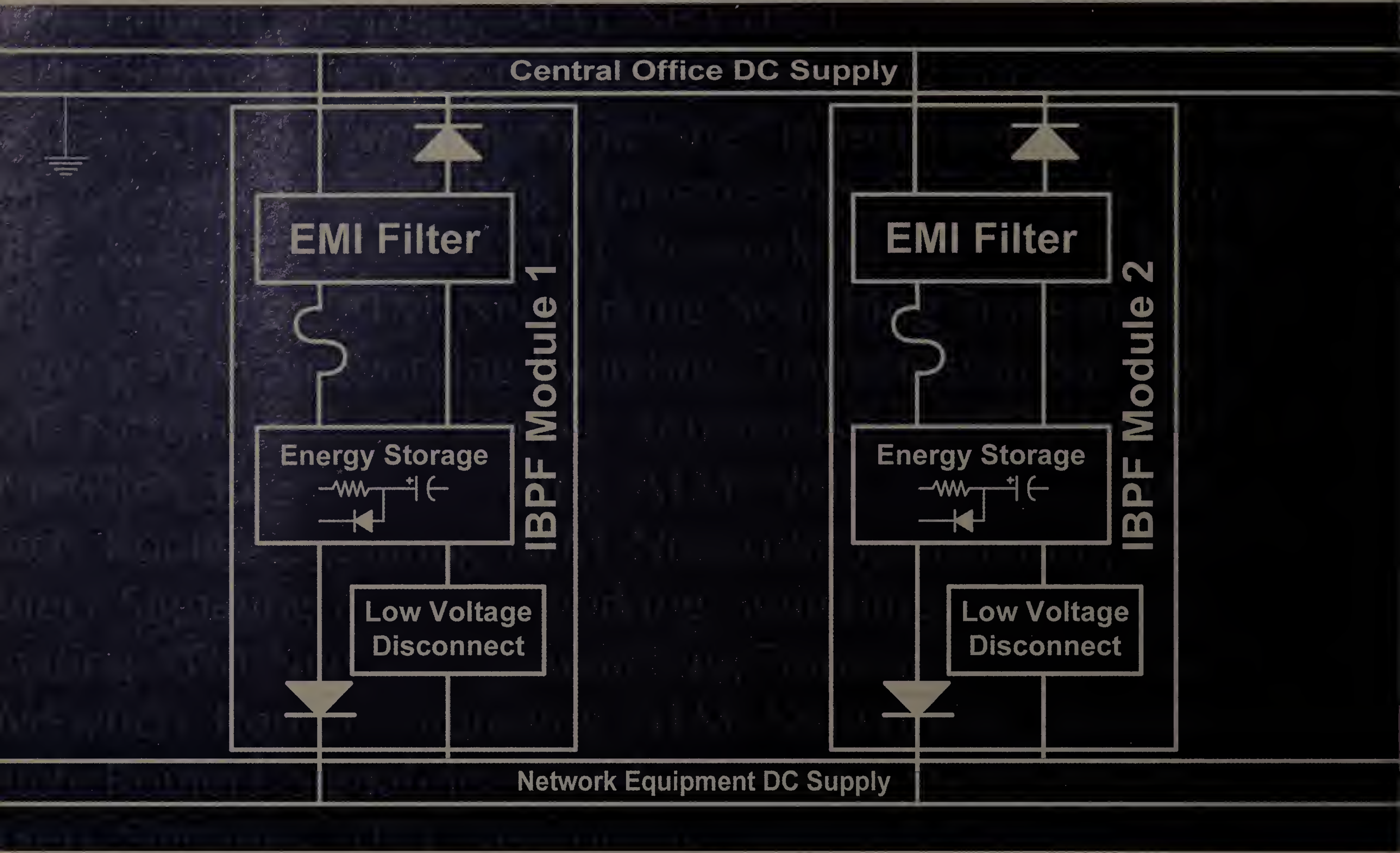

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Network FIRE prevention

VAL MINA

You'll need a tool kit that includes performance monitoring gear, application modeling tools and, soon, neural network software.

BY PAUL DESMOND

It's the universal complaint of the network executive: you spend too much time running around fighting fires — attending to the various network flare-ups that threaten to bring down your business.

But it doesn't have to be that way. There are tools available today that, while perhaps stopping short of fire-proofing your network, will lead you to where brush fires are starting, giving you time to douse the flames before they cause any real damage.

At the most basic level, performance monitoring tools help you get a lead on your normal network performance and perform trend analysis to determine when things are deviating from that norm. That won't fix your problems, but at least it will point you to where trouble spots are developing in time for you to take corrective actions.

There are dozens of performance monitoring tools available — from vendors including Concord Communications, FirstSense, Ganymede Software, International Network Services (INS), NextPoint Networks and Tavve Software — many of which get rave reviews from users.

Modeling tools hold another key to predictive net management. Vendors, including Ganymede, MIL 3 and Optimal Networks, offer tools that can help you predict what the addition of a new application or other changes will mean to your network performance. In some cases, the tools enable you to conduct stress tests and what-if scenarios, such as predicting the effect on response time of adding another 100 SAP R/3 users.

"That's proactive in that you can start to find envelopes of behavior where you can function normally and where you're going to start getting in trouble," says John McConnell, president of McConnell Consulting in Boulder, Colo.

Lurking on the horizon is neural network technology, which promises to further the predictive network management cause even more. Computer Associates already has neural agents, dubbed Neugents, for predicting impending doom on NT servers. The devices "learn" about the behavior of the system they're monitoring and can give advance warnings when situations occur that have led to problems in the past. The company expects to deliver Neugents for routers and switches by year-end.

Baselining and performance monitoring

Performance monitoring tools, such as Concord's Network Health and Ganymede's Pegasus, generally paint a picture of what your network performance looks like under normal, everyday conditions, and then point you to areas in which performance is subpar. Depending on the modules you implement, you can get reports on network performance or on network and application performance.

Ganymede, for example, offers a severity index based on a composite of availability, response time and throughput exceptions. Based on a scale of one to 100, the index helps you identify which elements are operating farthest out of their normal range, theoretically pointing you to the source of a performance problem. Pegasus also provides a trend index that shows which elements are changing most rapidly. "It points you to the issues that will make the phones ring next week," such as a frame relay link that is operating at an unusually high utilization rate, says Jim McQuaid, director of monitoring solutions at Ganymede.

Nortel Networks is nearly done deploying Pegasus on its worldwide WAN, says Peter Massam, network management technologist for the company in its Maidenhead, England, network operations center. "The first real useful data to come out of this was the aggregated views we had of our locations," Massam says. "We could see full application performance by region and identify the hot spots to concentrate on."

For example, the product helped him troubleshoot a nagging performance problem on a link between the U.K. and Madrid. Pegasus confirmed that application response time was subpar and indicated it was due to sluggish throughput on the link. Bumping up the speed of the link quickly cured the problem.

Similarly, Massam says, Pegasus has pointed Nortel to frame relay links that were underutilized, meaning Nortel was paying for more bandwidth than it needed given the amount of traffic flowing over the link. The company was able to lower the committed information rate on those links, saving money.

Jim Gross, manager of telecommunications for Lockheed Martin in Research Triangle Park, N.C., has had similarly positive results with Tavve's performance monitoring tool, which he has been using for about a year. "It points us to a pending problem almost weekly," he says.

For example, the Tavve tool alerted Lockheed to abnormal bandwidth usage that threatened the performance of a client/server application in a Washington, D.C., office. "We were way ahead of the game in identifying what that additional bandwidth was being used for and were on the phone getting them to curtail that activity before customers were on the phone telling us their application wasn't working anymore," Gross says.

Peter Massam says Pegasus helped Nortel save money on a frame relay link.

Tavve's product, dubbed tsc/PRM, works with Hewlett-Packard's OpenView or Tivoli's NetView for AIX, feeding off SNMP data those systems collect to create Web pages that graphically show network performance. "And it's up-to-the-second current," says Anthony Edwards, founder and chief technology officer for Tavve.

Users can set thresholds and be warned when a device is within 30, 60 or any other number of days of reaching the threshold. For example, maybe a router's CPU is operating at 60% of capacity half the time, when the threshold is 70% half the time. The Tavve product could determine that if CPU utilization continues to increase at the same rate, the threshold will be reached in 30 days, giving the user time to troubleshoot the problem. There's also a report that lists seemingly minor events that are happening repeatedly, an indication that a problem exists. And a service-level agreement facility alerts net managers well ahead of time if they're in danger of not meeting an SLA.

"We're using the reports to try to be proactive with our network and look at trends," says Mark Jones, enterprise management systems analyst III at BB&T, a bank based in Winston-Salem, N.C., that has about 600 branches. Besides the bandwidth utilization reports, Jones notes that tsc/PRM alerts him to the top 10 consumers of bandwidth on the network, which helps in troubleshooting.

Tavve users invariably point to the company's correlation engine, tsc/EventWatch, as the crown jewel of Tavve's product lineup. While a correlation engine would not seem to be proactive in nature — it sorts through alerts to identify the source of an outage — users say the Tavve product is so good that it can sometimes help them repair the fault before end users are aware there's an outage. And it definitely reduces the time it takes to fix a problem, users say (see story, this page).

Model of success

Network modeling tools are more proactive still, alerting you to potential problems before you go live with changes to your net.

Robert Rohlin, senior consultant with Modis Solutions, a consulting company in Dallas, has been using MIL 3's ERP Network Guru for SAP R/3 to model an SAP installation for a petrochemical company client that has a 6,000-user network.

Each of the company's 27 sites will be running SAP and many of them are overseas, compounding the response time issue. Rohlin already had baseline performance data from Concord tools that he could plug in to the MIL 3 product. To that, he added the expected SAP traffic load.

"The thing we really like about MIL 3 is that we can get real specific, saying how much memory each router has, how much bandwidth and what protocols it's running," he says. You can also define heavy vs. light users, the specific SAP modules employed and various other characteristics. Given all those variables, he says it takes time to build the initial model, but once that's done it's easy to create multiple scenarios to find the one that yields optimal performance.

The modeling tool also points out potential problems that would be easy to miss. For example, if you double bandwidth from one site to a particular application server, it could slow response time for all others using that server because now there is more competition for the same resources.

There are two general ways to conduct network modeling, according to March Cohen, CEO and chairman of MIL 3.

The first is analytical, where the modeling tool uses mathematical equations derived to approximate protocol behavior and delays. The other is discreet, which involves modeling actual, individual packet transactions, including how packets are delayed at different points in the network and the effect of any protocols involved. "The discreet model is almost a replication of what's happening in reality," Cohen says.

With any modeling tool, it's crucial to verify your results before diving in too deep. Cohen says you should start by getting baseline performance data for a given application using existing monitoring tools. Then model that same application and compare the results. As you make changes, again compare the results from the monitoring tools with what the modeling tool predicted.

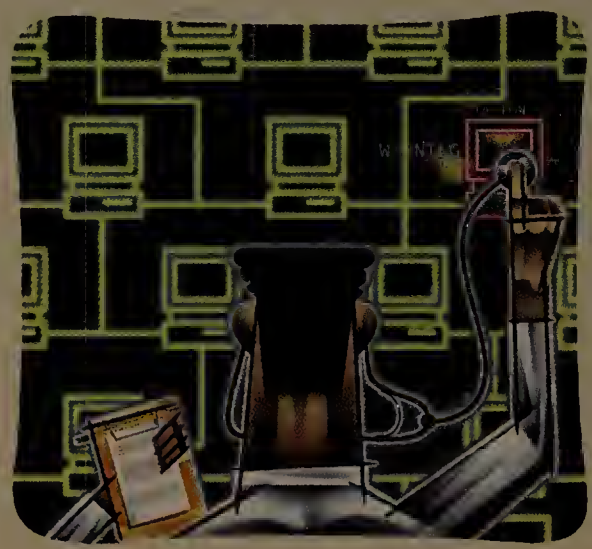
That's essentially what Rohlin did to verify that MIL 3's tool was giving him accurate SAP modeling data. SAP was already installed at some sites in Europe, and

Continued on page 52

TAVVE: A DIFFERENT TAKE ON PROACTIVENESS

Proactive network management means heading off problems before they become serious enough to grossly affect end users, such as identifying when a link is becoming so jammed that response time will start to suffer if something isn't done.

So correlation engines, while certainly valuable tools for any organization, don't seem to fit the proactive profile. They root through the myriad alerts that can result from a single device going down and perform analysis that points to the likely source of the problem. By their nature, then, they are reactive, not proactive; the problem has already occurred.



VAL MINA

The folks at Tavve Software disagree with that premise, as do some of the company's customers. Tavve's tsc/EventWatch is different because it uses active correlation technology, says Anthony Edwards, the company's founder and chief technology officer.

Say you have a massive outage with 2,000 devices going down, all because a single router failed. But the failed router was just polled and was up at the time. It won't be polled again for maybe five minutes. With most systems, that's five minutes wasted, Edwards says.

Active correlation doesn't work that way. Instead, tsc/EventWatch refers to its network topology database to determine the likely cause of an outage and immediately polls all devices in the suspected path.

"Correlation typically takes one second," Edwards says. With that kind of performance, and depending on the type of outage, network managers have a chance to fix the problem before users notice it. "If you can report a device down before customers realize it's down, that can be considered proactive."

Arun Kant, vice president of IS in the corporate technology services unit of Prudential Insurance, says Tavve's root cause analysis engine helps his company be proactive.

Prudential has a performance group charged with watching the company's various switches, routers, hubs and other devices to ensure they're operating at optimum levels. If the group sees a router CPU that is overloaded, it can use the Tavve correlation engine to find possible causes.

"Eighty percent of network downtime is spent looking for problems and only 20% is spent fixing them," Kant says. "So a timely root cause analysis is very important. Tavve has helped our performance group work very well and do a proactive type of management."

Keith Ferry, enterprise management technical manager at BB&T, a large bank based in Winston-Salem, N.C., likewise says Tavve helps his company quickly pinpoint the source of a problem when one of his 4,000 network devices goes down.

"You can say it's proactive in that we can find out what's wrong quicker with Tavve than we could before," he says. "Without Tavve, we'd get swamped with a bunch of phone calls and didn't know where the problem was."

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RELIGIOUS WAR PETERS OUT

There has been something of a religious war going on among performance monitoring tool vendors over the merits of synthetic transactions versus watching actual network traffic.

Simulated application traffic takes the client and server machines out of the equation. Rather than measuring the response time for an actual transaction, which would involve processing on the client and server ends, packets that mimic an application data flow are sent between agents on either end of the network link being monitored. This lets you measure the performance of the network apart from all other elements that may affect performance.

The other alternative is to passively monitor actual data flows over the network. This gives you a better idea of what users are actually experiencing. True enough, but it also makes it tougher to troubleshoot problems; any element in the path could be at fault — network, server or client.

Thankfully, the religious war seems to be coming to an end as a number of vendors are incorporating both technologies into their products.

Ganymede, for example, this month is expected to ship a new version of its Pegasus product that adds the passive technique to the existing support for simulated transactions.

"The religious war is not doing anybody any good," says Jim McQuaid director of monitoring solutions at Ganymede. "Both techniques have value."

VAL MINA

Concord last month essentially went the same route when it announced Network Health — Response, a new response-time monitoring utility for its Network Health network performance monitor.

"Now you can compare and contrast data sources, the synthetic vs. actual," says Kevin Conklin, vice president of marketing at Concord. Concord is also working with Ganymede, NetScout, Response Networks and Cisco to enable users to pull response time and/or RMON data from their tools into Network Health, letting the Concord product incorporate that data into its Web-based reporting engine. Additionally, Concord is now reselling a response time monitor from First Sense.

Continued from page 50

the company was collecting monitoring data. He diagrammed a small site in Germany using the ERP Network Guru, ran some simulations and matched it up to the real-world performance data. "The results were amazingly close," he says.

Neural nirvana

Neural network technology, and potentially other forms of predictive logic, may likewise one day prove to have some fairly amazing predictive capabilities.

Frank Dzubeck, president of Communications Network Architects, a consultancy in Washington, D.C., says neural logic is one of three types of logic that may come into play to yield more proactive network management systems. The other two are chaos logic, which determines patterns when none are evident, and genetic logic, which detects patterns in hierarchical structures, from one generation to the next.

Neural technology is furthest along at this point, with Computer Associates already delivering the technology for NT systems. Dzubeck says IBM is working on neural agents of its own. IBM says it doesn't use the term neural, but Tivoli's Distributed Monitoring technology is based on the same principles.

Sorrel Jakins, director of server systems at Brigham Young University in Provo, Utah, has been testing CA's NT-based Neugents since last fall. "We have about 30 to 35 NT servers and it's working very well on those."

Typical statistical inference engines make predictions of future failures based on a large spread of existing data. Neugents don't require this existing knowledge base; rather, they continuously monitor a system or device and determine the complex patterns that indicate abnormal behavior.

"Neugents are pretty good at taking skewed data and still making a good prediction," Jakins says.

Ron Cass, divisional assistant vice president for Neugent research and development at CA, says Neugents train themselves to recognize patterns on an individual system or device by monitoring various parameters. On a router, for example, Neugents will monitor for excessive protocol traffic, header errors, IP address errors, fragment failure, discarding of good traffic — about 20 attributes in all.

Rather than working from a database of information about the same type of router, Neugents start fresh with each router they monitor, Cass says. "Every router is different. The amount of traffic a router responds to depends on where it is."

From the data they gather, Neugents learn what patterns of behavior lead to problems, including performance degradation, failed interfaces or whatever you program the Neugent to look for. Thresholds are set automatically, based on what the Neugent determines is normal behavior for the router, and they change every night to keep up with varying conditions. When a Neugent detects a pattern of behavior that led to a problem in the past, and if it's serious enough to trigger the threshold, the Neugent issues an alert detailing the impending problem.

Neugents live on CA's NetworkIT Pro management console and require no software on the device to be monitored other than standard MIB 2 and Remote Monitoring agents. Each Neugent can monitor between 10 and 50 devices, depending on their complexity, but there's no limit to the number of Neugents you can install.

Jakins says BYU has seen occasions where a Neugent says network traffic is increasing such that a server will have a problem in 15 minutes. "We've had our network people take corrective measures, but we've also sat back and watched to see what happened," he says. "The timing has been pretty accurate, and the predicted effects have been accurate, too."

Asked if he sees the Neugent technology translating to a network scenario, where it can make the same sorts of predictions for routers and switches, Jakins answers with a thoroughly optimistic "most definitely."

Desmond, a former Network World *editor, is now vice president of King Content, a strategic publishing company in Southborough, Mass. He can be reached at paul_desmond@king-content.com.*

OUTSOURCE THE JOB

If you'd rather hand off the performance management chores, there are companies such as Candle and NetOps that will do it for you remotely.

NetOps, for example, has Distributed Status Monitors (DSM) that collect performance data from more than 50 different network devices, says Ed Young, director of business development. You download the DSMs from the NetOps Web site and configure them to monitor your various network devices by completing a Web-based form.

Alternatively, NetOps will do all that for you.

After initially creating a network model and baseline, the DSMs continually monitor the network and collect data which is periodically uploaded to the NetOps site. The company analyzes it using rules-based tools to identify problems, and ships back a report detailing the problems and recommended fixes.

This week, NetOps plans to come out with a version of its toolset that users can run on their own site, to identify problems in real time, Young says. It will feed data into enterprise platforms, such as OpenView.

Because the product interrogates network devices every second, using only a single packet per device, it is likely to find out about problems much faster than OpenView or similar tools that poll only every few minutes — theoretically enabling you to fix or get around the problem before it disables users.

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The INTERNET at 60

On the 30th anniversary of the Internet, its founders look deep into the future and see the 'Net everywhere.

BY SHARON GAUDIN

You set your alarm clock for 6 a.m. But the trusty device starts the coffee maker and wakes you at 5:30 a.m. because it was scanning the Internet and discovered that an accident has traffic jammed up heading into the office.

Once you get to work, you deliver a business presentation with the help of a chip that whispers real-time stock information directly into your ear.

Welcome to the Internet in 2029.

While founders of the Internet and industry watchers argue the specific birthday of the 'Net, most generally agree that its foundation was laid 30 years ago, either this month or next. There is little agreement whether it began with the first node installed, the first transmission between a mainframe and an Interface Message Processor 15 feet away or with the first logon via the network.

What the founders do agree on is that there is much in store for the next 30 years. And that vision has the 'Net rocketing off laptops and handheld devices straight into the walls of our homes, the lenses of our sunglasses and even our bodies through embedded chips that will serve as spare brains.

The Jetsons never imagined it would be like this. But the Jetsons didn't have the Internet.

"Face it. We're about to move into a science fiction world," says Allan Weis, who helped build the first major Internet backbone in 1987 when he worked for IBM. "This technology is moving by a factor of 10 every five years. That's a factor of a 1,000 in 15 years. . . . People won't be able to believe what the Internet can do in 30 years."

Weis and other Internet visionaries say it's impossible to accurately predict the specifics of how the Internet will transform itself in the next 10 or 15 years. Thirty years ago, none of them would have anticipated receiving e-mail from their mothers or watching the stock market change because of online trading. The astronomical growth that the Internet has already been through is enough to boggle even their minds.

But they don't mind taking a stab at what they envision it will look like.

> ***"We hope to have a more or less stable interplanetary backbone in place by 2040."***
>
> Vint Cerf, senior vice president for Internet architecture and technology, MCI WorldCom

STAN BAROUH

"Twenty or 30 years from now, you won't be talking to me over the telephone," Weis says. "Through display technology, you'll be right there in front of me. I'll be able to reach out and touch you, and you'll be able to feel that."

And Weis, who today is president and CEO of Advanced Network & Services in Armonk, N.Y., adds that display technology will transform our idea of education. "If you're trying to understand, for example, the forces between atoms and molecules, it's hard to do that through a book," he says. "In 10 years, you'll put gloves on, grab a molecule, pull at the atoms and feel the pressures. What kind of learning will you get from that?"

Leonard Kleinrock, who as a graduate student at the Massachusetts Institute of Technology in Cambridge, Mass., researched packet switching and then went on to help install the first node on the ARPANet at UCLA in September 1969, says the Internet has only made baby steps so far.

"The Internet is moving out of cyberspace and into smart space," says Kleinrock, who now is professor of computer science at UCLA and chairman and founder of Nomadix, Inc., an Internet start-up in Santa Monica, Calif. "Your walls will have logic, processing, online connections and cameras. You'll walk into the room and it will know you arrived. You can ask aloud for information and a table of contents will pop up in the air and then tell you that the book you need is down the hall on a shelf.

"You'll also wear a body net connecting the devices around you. If your body net and my body net approach each other, they will recognize that and give us each information about the other," he says.

Don Heath, president and CEO of the Reston, Va.-based Internet Society, says the Internet will connect everything in his life from his alarm clock, to his grocer, to chips embedded in his clothing.

"The Internet will be so integral to everything we do, it will be transparent," Heath says. "The clothes you're wearing will know where you are. You'll say, 'I'm flying to Atlanta. What's the weather like there?' And a voice will answer you and tell you the weather, while it confirms your plane tickets and seating assignment."

And Vint Cerf, who, together with Robert Kahn, invented IP, adds that he expects that within just eight years the Internet will be out of this world — literally. Cerf, senior vice president for Internet architecture and technology at MCI WorldCom, is working with NASA's Jet Propulsion Laboratory to build an interplanetary backbone to serve space exploration, as well as benefit online communication on Earth

"The first satellites go into orbit around Mars in 2008, as many as a half dozen of them," says Cerf, who estimates that more than 50% of the world's economy will be online by 2010. "We hope to have a more or less stable interplanetary backbone in place by 2040. . . . The Internet will almost certainly be nearly ubiquitous — perhaps more penetrant than television, radio and telephony combined. The world's knowledge will find its way to the 'Net." ◪

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- **Founders of the Internet weigh in on how it turned out.**
- **Our Internet timeline highlights key developments.**

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Feature

CONNECTING THE CASINOS

BY APRIL JACOBS

Visit Las Vegas, and it's hard not to notice the erupting volcano at Mirage, the battling pirate ships surrounding Treasure Island or the soaring fountains of Bellagio. But one thing tourists don't spot is the ATM network that runs those three Mirage Resorts casinos.

Removed from the glare of the slot machines, gaming tables and floor shows, Mirage Resorts' ATM WAN links the Bellagio, Golden Nugget, Mirage, Treasure Island and an office building in Las Vegas with Beau-Rivage in Biloxi, Miss., and the Golden Nugget in Loughlin, Nev. All told, the network comprises some 13,000 nodes, including about 7,000 desktop PCs.

The fast-growing casino operator began upgrading its network from FDDI to ATM two years ago. Each casino has an ATM switch, as does the Las Vegas office building that houses the data center. The Las Vegas sites rely on OC-3 and OC-12 connections, while Beau-Rivage is linked to the WAN via multiple T-1 lines.

Mirage Resorts' network runs virtually every aspect of casino operations, from guest room card reader access to gaming stations and lines of credit. If the network goes down, operations can crash to a halt. Each hour of downtime can translate into hundreds of thousands of dollars in lost revenue, says Glenn Bonner, chief information officer of Mirage Resorts.

With bandwidth requirements soaring from new properties and increased business, Bonner faced a challenge: to deliver data to multiple sites with the best possible performance. To get a handle on what was happening on the network, Mirage Resorts turned to Network Associates' Sniffer Total Network Visibility (TNV) Suite 3.0 network monitoring and analysis tools.

> ***Mirage Resorts relies on an ATM network to give its customers the top-notch service they demand.***

"Part of our problem was being able to pinpoint where problems were coming from," Bonner says. TNV's network monitoring and control features help Mirage Resorts' IT staff detect and fix problems more quickly, as well as proactively address trouble that is brewing. For example, TNV can detect traffic issues, alerting network managers to jams or potential failures.

Bonner says Mirage Resorts is working toward centralized network management, but the company still needs roving administrators to troubleshoot and correct problems on-site. TNV allows the staff to plug into the network and access the same troubleshooting features available in the data center.

While TNV has been helpful for monitoring traffic, the process of upgrading the WAN is still not without potential pitfalls and anxiety.

The company's various hardware and software upgrades have entailed adding bandwidth or changing topologies, and Bonner notes that these changes have had an effect on the rest of the network. Mirage is rolling out TNV in conjunction with the upgrades.

Complexity has always been an issue for Mirage Resorts, as well. The company has no fewer than 17 operating systems in place, with 450 switches controlling network traffic. The goal is a state-of-the-art network with the best available tools to keep it up and running with as little downtime as possible.

In terms of business process improvements, the ATM network will undoubtedly play a central role, Bonner says. Enhanced functionality will enable Mirage Resorts' move toward a more paperless environment and automated business and technical processes.

So far, the network upgrade has let Mirage Resorts link and centrally manage its human resources, inventory/purchasing, casino credit and finance/accounting applications. According to Bonner, this move brought savings through reduced administration.

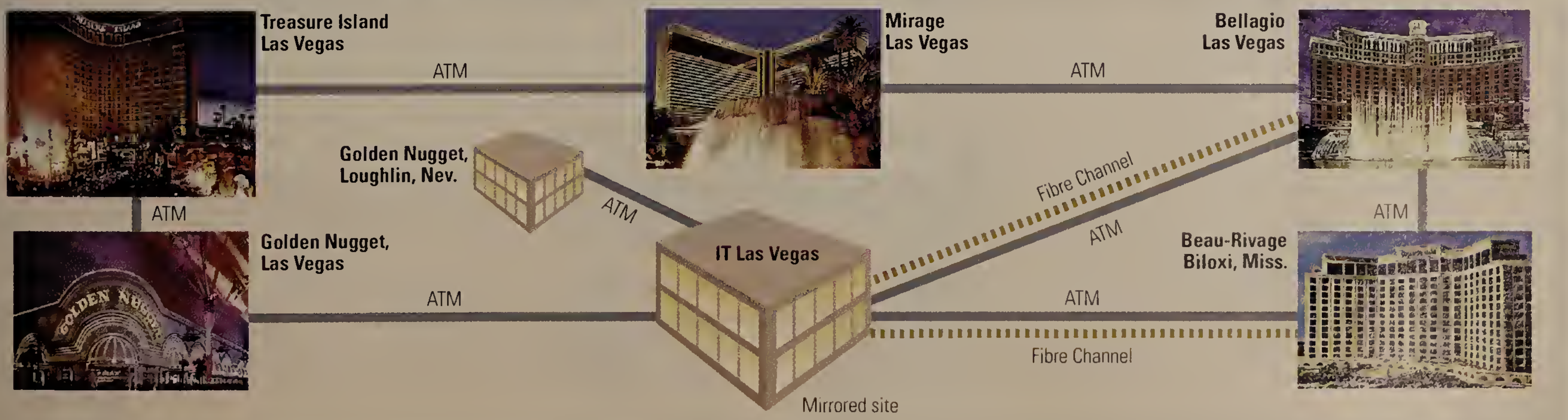
TNV has helped Mirage Resorts automate its help desk with trouble-ticketing. When a network problem arises, TNV alerts a technician who can get to work before end users notice any difference in performance. TNV also automatically queues end users for problem resolution.

Now that Mirage Resorts is able to provide better performance, the firm is focusing on deliver browser-based applications for Web transactions.

Jacobs is a freelance writer in Dover, N.H. She can be reached at ajacobs777@aol.com.

Mirage Resorts' WAN

An ATM backbone connects the firm's six U.S. casinos and an office building that houses the data center.



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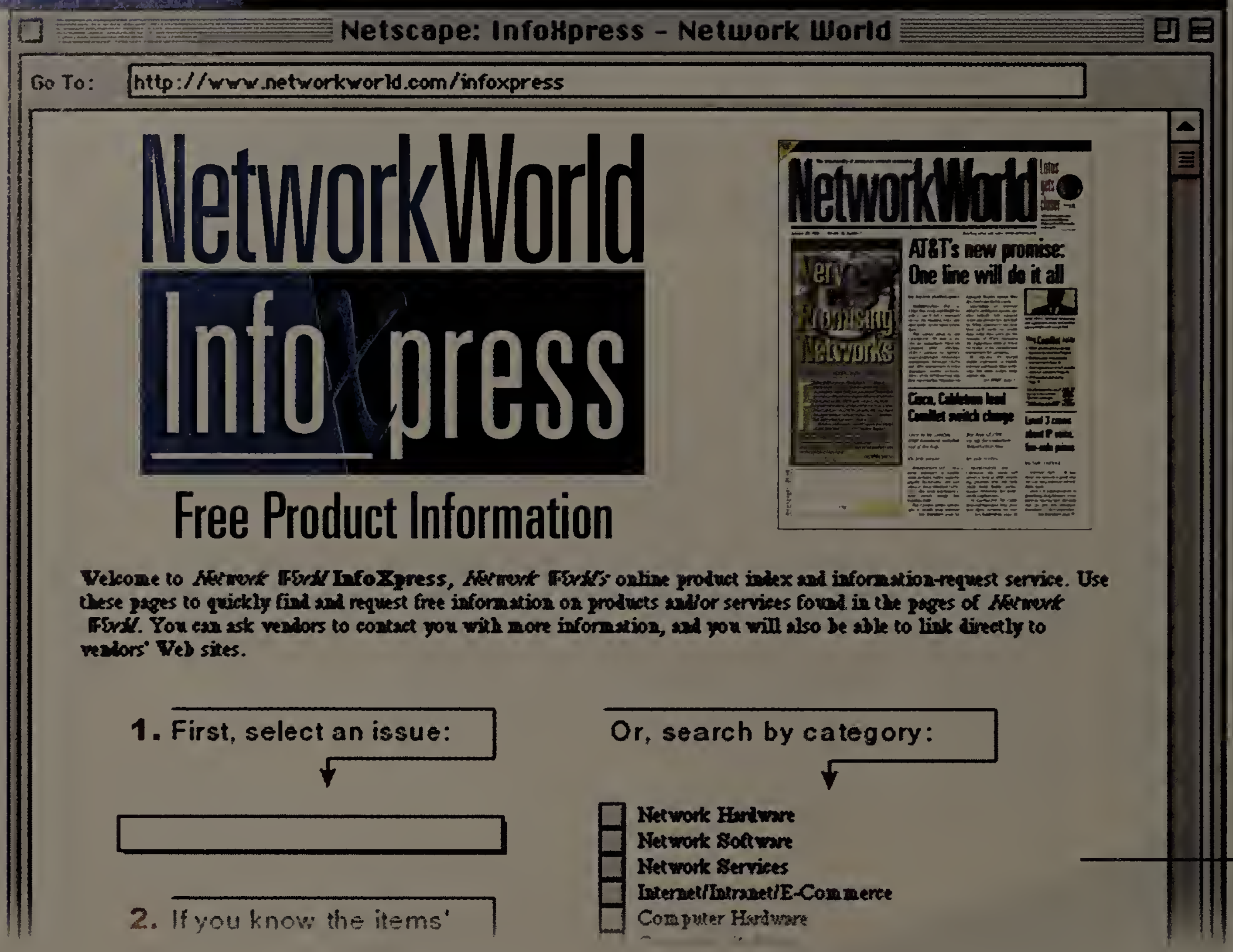
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Open your own Web store

Mercantec's SoftCart built the best e-commerce site, but it wasn't the best performer.

BY BARRY NANCE

Ready to set up an electronic commerce site? You can hire a team of programmers, graphic artists and database administrators, then spend months creating an online store. Or you can use ISP-provided software that lets you specify your products, set up your catalog, assemble your Web pages and begin selling on the Internet. The latter approach is quicker, easier and less expensive, but it limits you to the features offered by the e-commerce site building tool.

We evaluated two such site building tools, Mercantec's SoftCart 4.1 and Intershop Communications' Intershop 4 Merchant Edition, to determine which you might use to build your online store. Intershop 4 performed well and scaled better than SoftCart, but SoftCart edged out Intershop with a rich feature set that included an Intuit QuickBooks interface and a bundled search engine. Its flexible administration also made such tasks as inserting graphics alongside each product easier.

We also invited Broadvision, ClearCommerce and Open Market to submit products for this review, but they declined. Open Market's reason was typical — its product is of such scope that it requires customers to attend training sessions and have an Open Market consultant on site to help with implementation.

In less than a day, either tool we tested can put up a small, simple online store selling a few hundred items. Both do a good job of producing packing lists, tracking inventory and allowing for discounts and special sales promotions. If you want to make your store more sophisticated and visually compelling, both tools integrate well with Web page design utilities such as Microsoft's FrontPage, SoftQuad's HotMetal and Allaire's HomeSite. SoftCart 4.1 and Intershop 4 have a browser-based administrative interface and also ensure security via Secure Sockets Layer and password-protected administrative access.

Both site building tools seemed easier to install and configure on Netscape Enterprise Server than Microsoft Internet Information Server (IIS). On IIS, the products require a bit of finagling before you can begin building your store. The tools run on Windows NT Server and various flavors of Unix, but connecting to third-party databases (such as Oracle) via Open Database Connectivity is only possible on Windows NT.

Setting up shop

While we had to install the products, chances are you won't have to, unless you run an ISP or plan to host corporate commerce sites. Your first step will be building your online store.

SoftCart 4.1 offers drag-and-drop easy assembly via a comprehensive collection of templates. We liked the flexible Template Guide, which led us through modifications to the templates. The process didn't require any HTML expertise on our part and gave us an uncomplicated "paint-by-numbers" environment for making our store distinctive and appealing. With SoftCart's Store Manager module, associating a scanned photograph or other graphic with each catalog item took fewer steps than similar operations with Intershop 4.

Using SoftCart as a site creation tool and operational environment for our second e-commerce site, which sold personal information to subscribers, proved more difficult than with Intershop 4 because of the extra business logic involved.

Putting Intershop 4 to work in our lab was like buying a prefabricated retail store. It's an e-commerce-specific product that includes all components a small or midsize business needs to begin selling goods on the Web.

Intershop 4 ships with a copy of Sybase's Adaptive Server Version 11, into which we easily loaded our products and customers through Intershop's Data Import Wizard. The product included attractive store banners that we linked to individual product Web pages, as well as each customer's shopping cart Web page.

We especially liked the product's graphical Store Design Wizard, which made quick work of creating complete new storefronts with its point-and-click interface. Intershop 4 required little computer or Web expertise on our part, and we found it an ideal tool for less-experienced merchants who want to open Internet storefronts. The Intershop 4 design tool's easy-to-navigate interface was helpful as we inserted items into our product catalog and defined our inventory, sales tax and shipping options.

As we customized our online stores, we used Intershop's Template Language Extension (TLE) to script our handling of products in the shopping cart and manage our product inventory. TLE is a capable programming language that's easy to learn and makes Intershop 4 highly customizable. However, TLE is proprietary to Intershop and has no visual design environment. Finding or training TLE programmers could be an obstacle to making a store look and behave the way you want.

In addition to using TLE, we created server-side Perl scripts that manipulated Web page data and processed our customer and bookstore database in business-specific ways.

We liked Intershop 4's Staging Wizard, which we used to update a live active store. The Staging Wizard copied our store, let us modify the copy and then migrated the new version back to the live store. Without taking our store offline, we updated product information, pricing and Web page graphics easily and painlessly. In contrast, to modify our SoftCart 4.1 store, we had to close portions of the store during the update process.

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Read past reviews of Microsoft SiteServer Commerce Edition, IBM Net.Commerce, Lotus Domino.Merchant and others.
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Both tools need better facilities, such as a Java-based scripting engine, for incorporating custom business logic into the shopping experience.

While building the catalog with both products was pretty simple, you should expect more out of an e-commerce application. Each product offers some interesting extras.

Creating an online personal information database that incorporated search engine logic into the storefront was simple with SoftCart 4.1. Setting up Oracle queries to search the database was just a matter of pointing and clicking in SoftCart's site design environment. For more flexible searching, Mercantec bundles the Simple Web Indexing System for Humans freeware search engine tool with SoftCart.

Both products claim to offer the use of a wide selection of third-party payment methods. SoftCart says it

ScoreCard

	Features 30%	Manageability 25%	Performance 20%	Reporting 15%	Installation 5%	Documentation 5%	Total score
Mercantec SoftCart 4.1	8	7	6	6	5	6	6.8
Intershop Communications Intershop 4 Merchant Edition	6	7	8	6	5	6	6.6

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

NetResults

Product	Pros	Cons
SoftCart 4.1 **Mercantec** (630) 305-3200 www.mercantec.com **$100** per month, per store	**Pros** ▲ Easy point-and-click administration; separate security for retail store and system administration. ▲ Interface to Intuit QuickBooks and a bundled search engine included.	**Con** ▼ Needs a Java-based scripting engine.
Intershop 4 Merchant Edition **Intershop Communications** (800) 736-5197 www.intershop.com From **$50** per month, per store plus an installation fee	**Pro** ▲ Good performer; produced smaller Web pages that loaded quickly.	**Cons** ▼ Script language is proprietary. ▼ Needs a Java-based scripting engine.

supports American Express, CyberCash, ICVerify, PaymentNet, GlobeSet and WorldPay, while Intershop 4 says it works with CyberCash, CyberSource and ClearCommerce. However, CyberCash didn't have its Intershop 4 payment module ready in time for this review.

Each product takes a different approach to electronic data interchange (EDI), a feature you can use to interface to other businesses or other applications within your business. SoftCart's support for EDI includes the ANSI X.12 and EDI for Administration, Commerce and Transport (EDIFACT) standards, while Intershop 4's EDI interface consists of an optional XML-enabled developer's tool kit for C++ programmers. By assuming the role of a programmer, we were able to use these EDI interfaces in a straightforward fashion to simulate connectivity to legacy back-end applications such as accounting, order processing and customer maintenance. If you need to use EDI to connect your store to another application, that application's ANSI X.12 or XML interface requirement may be a deciding factor between Intershop 4 and SoftCart 4.1.

Neither product actually sends reports to a printer, unfortunately. SoftCart 4.1 and Intershop 4 merely display summary screens showing inventory levels and customer lists, which include fast-moving items and frequent customers.

The several user guides and reference manuals accompanying both products contain helpful screen illustrations and accurate step-by-step instructions.

Managing the store

After you've set up your store, your job is not even half over. You still have to maintain it — change prices, add new inventory and maybe run sales or special offers.

Administering a SoftCart-based online store is child's play. Separate logon accounts and passwords for system-level access to the Web server environment and for each individual store ensure that unauthorized users can't hack or rob your store. Intershop 4's security distinguished between individual modules within a store, such as inventory and order management, but it did not separate system-level and individual store access the way SoftCart did. Both tools made setting up sales promotions, updating catalogs and producing reports easy and painless.

The shopping experience

Both storefront environments dynamically create Web pages that track shopping cart contents, recognize customers who have previously visited the store and let customers with incomplete sessions return to the store hours or days later to resume shopping. However, there were some differences in the responsiveness of the two products' sites.

Because it intelligently cached database content as well as Web page material and came bundled with the high-performance Sybase Adaptive Server database, Intershop 4 served up a quicker shopping experience than SoftCart 4.1 in our tests. The Web pages it generated were smaller and loaded more quickly in our lab. Intershop 4's data and page caching features made good use of available memory to reduce disk accesses, and its optimized assembling of dynamic HTML pages made those pages appear more quickly in our browser window. As measured by Network Associates' Sniffer TCP/IP protocol analyzer, Intershop 4 was about 25% faster than SoftCart.

Unlike SoftCart 4.1, InterShop 4 Merchant Edition has national language support for English, German, French and Norwegian. This support consists of Web page text and prompts in the language you select, which means more people will be able to understand and use your store's Web pages.

SoftCart 4.1 and Intershop 4 are solid e-commerce site building tools because they offer a friendly shopping experience and excellent administrative functions. Intershop 4 was an ideal environment for our online bookstore. The straightforward process of selling goods is Intershop 4's strength. It had excellent performance and data handling capabilities, and it provided us with a range of useful statistics about our customer base.

SoftCart 4.1 was slightly easier to use, and its server-side state tracking mechanism made it more browser-friendly. SoftCart's catalog building tasks were also simpler and more straightforward.

Both products are especially appropriate for ISPs that want to host e-commerce for business customers. If your ISP offers either tool as a platform for creating and operating your online store, you can feel confident you'll be using a tool that's attractive, easy to administer and reliable. However, be aware that other tools, such as IBM's Net.Commerce, can produce a virtual storefront with more administrative features, a greater range of reports and higher scalability when traffic surges, as long as you're willing to maintain the host server yourself.

Nance, a software developer and consultant for 29 years, is the author of Introduction to Networking. *You can e-mail him at barryn@erols.com.*

How we did it

We subjected each electronic commerce site building tool to a battery of tests, first using Netscape SuiteSpot Enterprise Server and then Microsoft Internet Information Server. Both Web servers ran on Windows NT Server 4.0. We used several dozen clients running Netscape's Navigator 4 and Microsoft's Internet Explorer 4 browsers to administer the sites and purchase products.

The tests for both products simulated the creation and operation of a pair of Web-based e-commerce sites, one selling books and the other selling access to a collection of personal information that contained driving records, buying habits and credit histories.

Using each vendor's database interface, we stored an item's photograph, specifications and pricing in a catalog. Intershop bundles a copy of Sybase Adaptive Server 11 database with its Merchant Edition software. To evaluate the structure and layout of the database, we used Sybase's PowerDesigner tools. For Mercantec's SoftCart 4.1, we invoked its Open Database Connectivity interface to connect to an Oracle8i database, which we inspected with Oracle Designer.

We also looked for design-time features that helped us quickly build our e-commerce site. We evaluated how well and to what extent each product automated the building of a Web-based storefront. We also considered how each product let us customize our storefront to accommodate unique business requirements, such as for our personal information database. We used preconfigured components for managing shopping carts, sales tax, shipping charges and store catalogs. We looked for useful features such as the ability to put items on sale, modify the store's appearance without having to take it offline, accept a range of electronic payment types and produce useful reports.

At run time, we looked for correct and consistent processing of sales transactions as well as reliable operation. We also examined the sizes of the Web pages each product created using Network Associates' Sniffer software to discover the page sizes as they entered our network.

To measure performance, we timed the loading of Web pages in each product's environment and the processing of each sales transaction.

In the performance tests, 30 clients concurrently purchased items from our online store while we closely monitored response times, server workloads and network utilizations. For all tests, we rebooted both the Web server and the clients to eliminate the effect of caching on performance.

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Cool Tools

Quick takes on high-tech toys

Lee Schlesinger, Test Center Director

STACKING YOUR WEB PAGES

I moonlight as a Web page developer, and I have one tough boss — my wife. She's a real estate agent, and for a while she was getting a good deal of business from her Web site. This year, her Web traffic dried up, and she insisted on knowing why.

I couldn't tell her, until I turned to two very useful applications for analyzing Web pages. The applications check URLs you specify against search phrases at multiple search engines and tell you where you rank. They also give you tips on how to improve your rankings.

WebPosition Gold is the Cadillac of the field. In addition to the basic features, it can generate simple pages, critique pages for their suitability for various search engines, submit pages to search engines, report on the traffic coming to your site and generate reports automatically.

If each of your page hits is worth cool cash to your organization, the tips this $149 program provides on improving your site's ranking will be well worth the price. WebPosition Gold suffers from a lack of cohesiveness, however.

TopDog performs some of the same tasks as WebPosition Gold. It covers 175 search engines. It too can submit pages and generate reports, but it lacks WebPosition's tips, among other features.

TopDog makes up for those deficiencies with a clean, intuitive interface. Like WebPosition Gold, you can run a search for multiple phrases against multiple search engines. TopDog reports on what page and at what position your site is found. Click on any line of the display to see a representation of the actual page returned from the search engine. You can look at sites that ranked above yours to see how they wrote their pages. If your ranking falls below a position you specify, TopDog will resubmit your page to that search engine.

Using these tools made me realize that a single page isn't going to make it to the top of every important search engine for every important phrase that a user might type in. However, you can virtually guarantee you'll improve your performance if you run one of these programs regularly. My changes to pages, based on WebPosition Gold's suggestions, rocketed me to the "top dog" position on HotBot for one of my key search terms.

Download a trial version of both programs from Network World Fusion (DocFinder: 4723), and find a link to a free Web-based tool that checks your rankings one search engine at a time. ◪

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Career matchmakers

Zero in on the major job sites that will point you to the right network positions.

JOHN UELAND

BY DAVID RATHS

Career management Web sites are fast replacing newspaper classified ads as the recruitment tools of choice, which is great news for job seekers. By registering with a handful of sites, you can get your résumé in front of hundreds of employers with minimal effort.

The question is which job sites to use among the thousands out there. Because the sites are free to job seekers, there's no risk in trying several to find the ones that best suit your needs. But to give you a head start, we offer the following roundup of features you'll find at the major career sites.

• www.computerjobs.com

If you know the city you want to work in, ComputerJobs.com's regional approach might save you some time. The site takes a regional and skill-specific approach to connecting IT workers and employers.

For example, a recent search for jobs in the Washington, D.C., area resulted in 2,280 listings. Positions are grouped into classifications such as Unix, enterprise resource planning and networking/telecom, then broken down into more specific subcategories. While the site only focuses on nine regional markets to date, it's expected to launch in 12 more areas by year-end.

ComputerJobs.com's 60,000 users have access to more than 24,000 jobs posted by 9,800 employers. By creating your own personal account on the site, you can customize and save your searches, access advanced sort and search features, and build your own personalized home page.

More Online

- Some of the major job sites on the Web.
- An earlier article on online job hunting.
- Network World Fusion Focus on Careers and an archive of previous newsletters.

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• www.dice.com

Are you looking for attention from recruiters? Check out Dice.com. Originally geared specifically for IT recruitment firms, the site was recently opened to employers, as well. It lists more than 120,000 permanent, contract and consulting jobs nationwide for programmers, systems administrators and other IT professionals.

• www.headhunter.net

The *Career Xroads* directory of career management sites calls Headhunter.net one of the hottest sites on the Web for IT. The site features more than 90,000 IT-related job postings and gives individuals and employers a high degree of control over how much information they share.

If you see a job you're interested in, you can apply directly from Headhunter.net. The powerful geographical search capability is another nice feature. You can search for specific positions within a predetermined radius of a city, and the site ranks all suitable jobs in order of proximity to that location.

• www.hotjobs.com

Privacy is a big concern for many online job seekers. After all, you don't want your résumé to pop up on your boss' screen. But there's no need to worry about this at HotJobs. Only member companies can search its database, and you can block up to 20 specific companies from seeing your résumé. Moreover, the site bans recruitment agencies.

Another cool feature is that you get statistics on the number of times your résumé has come up in a search and the numbers of times it has been viewed.

HotJobs features an average of 38,000 jobs and has about 475,000 résumés posted. Still, the site doesn't specifically target IT professionals, and a random search on the word "network" recently drew only 20 job matches.

• www.joboptions.com

While the IT-specific sites are good for homing in on targeted positions, a general site such as JobOptions.com often provides more in the way of career development. The site's Career Tools section offers dozens of resources to help you manage your career and job search, including salary figures, relocation data and information about continuing education.

On average, there are 175,869 jobs posted to JobOptions.com each month and the site has close to 186,000 résumés in its database.

• www.monster.com

If quantity is what you're looking for, this is the place to go. The 800-pound gorilla of career sites, Monster.com lists more than 229,000 jobs. While it doesn't specifically target IT professionals, the site still draws the most hits for specific IT job titles. Plugging the word "network" into a search box pulls down more than 1,000 jobs.

Along with regular e-mail updates of appropriate positions, some of the site's other attractions include résumé management, a careers network, chat and message boards, and free newsletters.

Raths is a freelance writer in Kailua, Hawaii. He can be reached at draths@lava.net.

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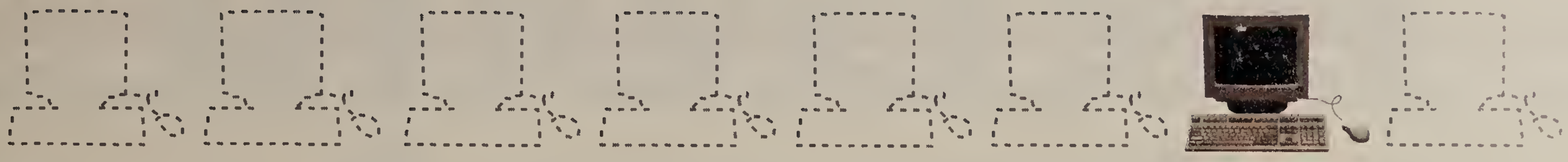

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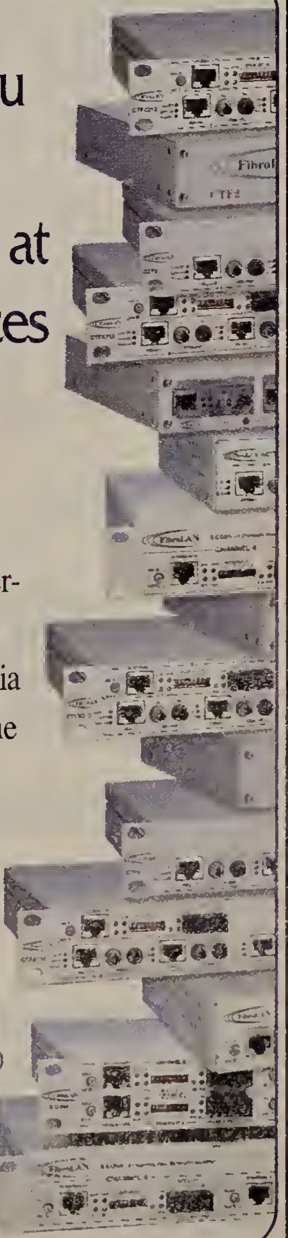

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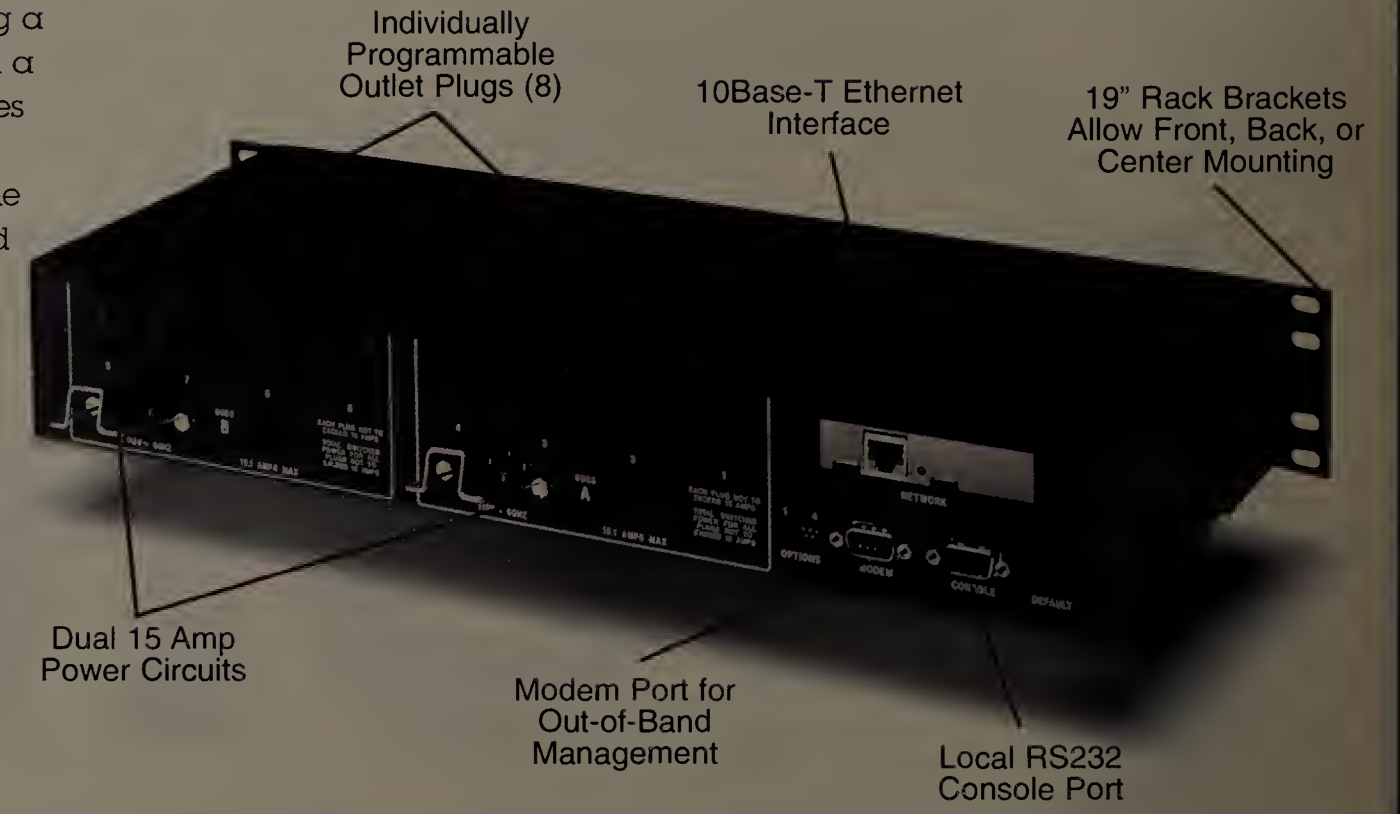
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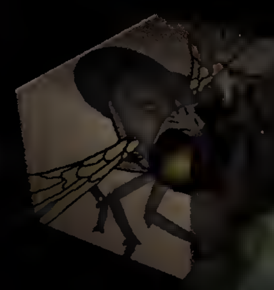

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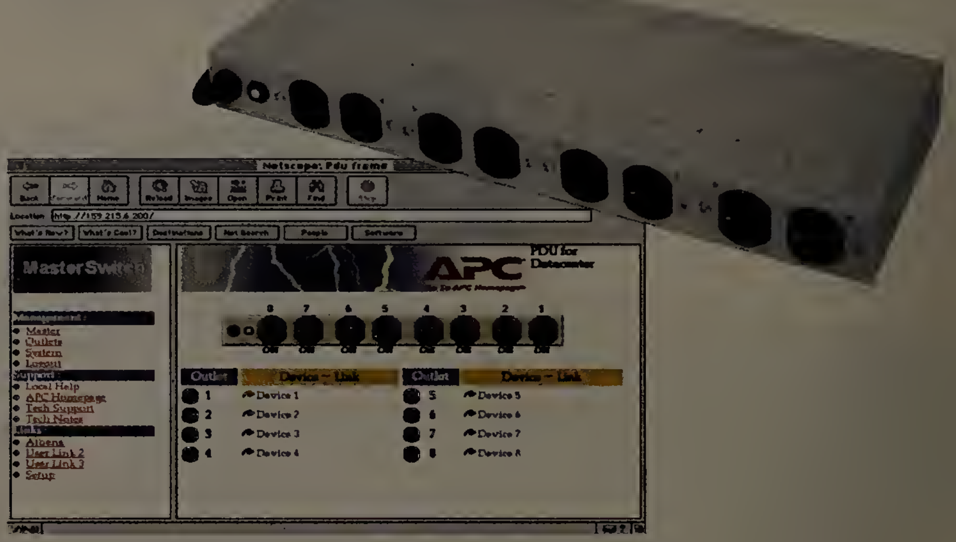

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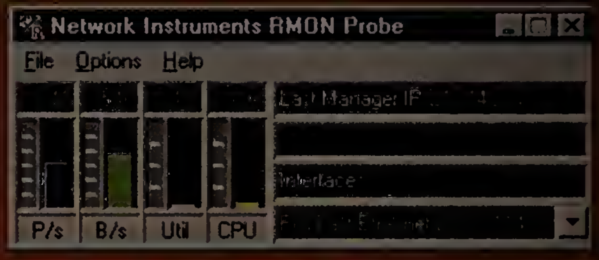

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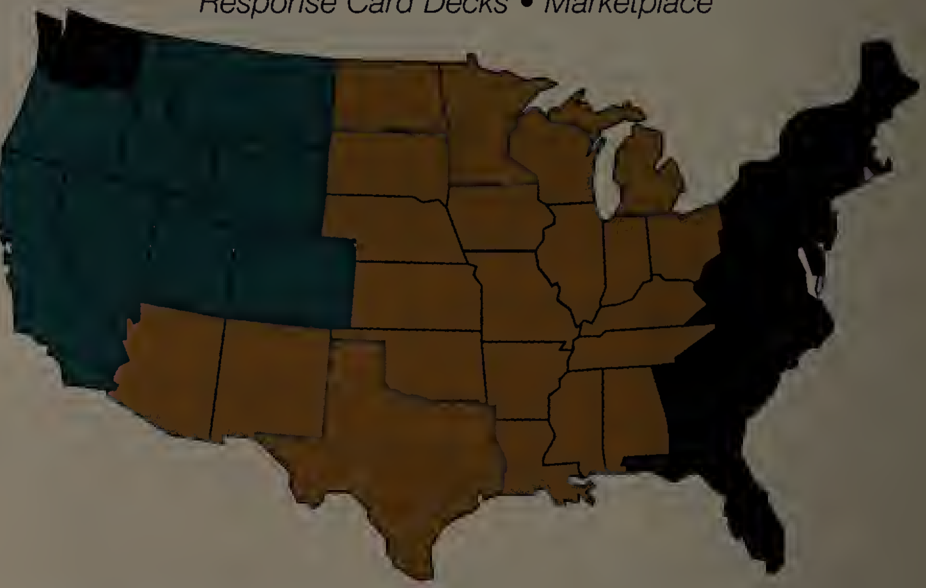

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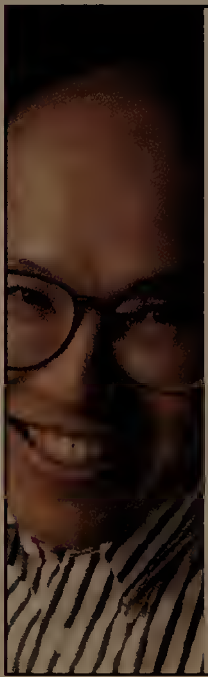

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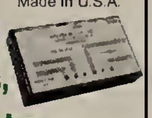

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Showdown,

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topic," says Jim Metzler, a principal of Ashton, Metzler and Associates, and a Showdown panelist. "We need more conversation on why the enterprise cares" about convergence.

"Today's convergence story is mostly just that — a story," said Romulus Pereira, chief operating officer at Cabletron. "Convergence spans more than the integration of voice, video and data" to build truly converged networks, Pereira said. Businesses need better management tools as well as consulting and support services that aren't available today, he added.

At the debate — where vendors fielded questions from Metzler, another consultant, this reporter, and each other — product interoperability issues were raised not only among multivendor convergence environments, but also in single-vendor environments in which several disparate products obtained from acquired companies might be pulled together.

The interoperability issue is key if vendors want to assure users that they can provide end-to-end quality of service in a converged voice/data/video network.

Lastly, vendors were challenged when it came to articulating a clear and compelling business case for converging separate enterprise networks into one.

"We're not yet seeing the killer application, although we've got some in mind," such as unified messaging and distributed call centers, said Karyn Mashima, Lucent's strategy vice president and chief technical officer (CTO).

The debate suggested that the vendor strategies for converging enterprise nets play off each one's particular strength. For example, Lucent and Nortel are concerned with protecting their installed base of circuit-switched PBXs, while Cisco extols the virtues of distributing and interconnecting PBX features through its LAN switches and routers. Cabletron's convergence story focuses on managing the converged environment with its Spectrum platform, while 3Com appears to be excluding large enterprise requirements after plans to create a new LAN telephony company with Siemens were scrapped.

Cisco's Marthin De Beer, director of the company's enterprise convergence strategy, asked if and how Lucent will open up its PBX base to IP telephony standards after a long legacy in proprietary PBX platforms.

"This is a great question — I love this — coming from the Proprietary King," Mashima quipped.

Vertical Networks' CTO Scott Pickett asked Nortel's president of enterprise voice solutions, T.J. Fitzpatrick, how his company can sell an array of complex products to a confused PBX customer base.

"Each one of the buyers has its own motivation" for converging or not, Fitzpatrick replied. "[Their decision] is not what we believe in, it's what the buyer is actually doing."

3Com was asked whether canceling its plans to create a new LAN telephony company with Siemens was a setback to the company's convergence strategy. 3Com's Bob Roman assured the panel and audience that it was not — just a change in execution.

Nortel then set its sights on Cisco and the issue of voice reliability on data networks. Fitzpatrick asked De Beer if he supported Cisco CTO Judy Estrin's alleged claim that data networks are more reliable than the public switched telephone network (PSTN).

"We've canceled all of our leases on all the PBXs on Cisco," was De Beer's strident reply.

An audience participant asked De Beer if the common practice of rebooting or resetting routers after a software patch or upgrade compromised reliability. De Beer replied that a distributed IP telephony infrastructure with redundant and alternate paths is inherently more reliable than a circuit-switched campus or the PSTN.

Lucent's Mashima challenged Pickett on the interoperability of Vertical Networks' InstantOffice PBX/LAN router with the installed base of PBXs. She also asked Roman whether 3Com's NBX LAN telephony product was based on a closed environment.

The give-and-take among the vendors and panelists, though lively and at times strident, failed to reveal a pressing business need for converged networks.

John Gallant, editorial director of *Network World*, monitored the debate.

Nortel's Fitzpatrick and Vertical Networks' Pickett didn't pull any punches.

PHOTOS THIS PAGE ALEN WEINER

"We've canceled all of our leases on all the PBXs on Cisco."

Marthin De Beer, Cisco

"This is a great question coming from the Proprietary King."

Karyn Mashima, Lucent, replying to a Cisco question on Lucent's closed PBX environments.

"Currently, the [NBX] system is typically deployed in a stand-alone environment where it only has to interoperate with itself."

Bob Roman, 3Com

"Convergence spans more than the integration of voice, video and data."

Romulus Pereira, Cabletron

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Novell,

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Directory Services (NDS), that was all part of the company's plan to position the product as vendor-neutral. Version 2.0 offers support for NDS and Lightweight Directory Access Protocol.

A directory-enabled caching server will be of particular use to companies managing intranets and extranets, says Peter Christy, vice president of the Internet Research Group in San Jose. "The issue of who is accessing what will become much more important, and the directory is the mechanism by which caches will be able to determine what rights individuals have," he says.

The Utah school system, which uses ICS 1.0 to cache Internet content for 500,000 students and teachers, has a need for the directory support. "Directory services would allow individual schools to filter out objectionable sites," says Don Porter, senior network administrator for UtahLink, a state-owned ISP for Utah's public- and higher-education system. "For example, you could have a more restrictive policy for elementary students than for high school students."

The other big addition to ICS 2.0 is support for multimedia streaming. The ability to cache RealAudio/Video, QuickTime, MP3 and other streaming data types — rather than having it clog up corporate backbone networks — could let companies quickly and efficiently serve up training videos, hold online company meetings or provide pre- and post sales information and support to customers.

Christy says streaming video overwhelms many corporate networks that are sized for little more than e-mail.

Novell declined to say how much Version 2.0 will cost, but a typical ICS 1.0 system costs between $5,000 and $10,000. ICS is sold through Novell's hardware partners, such as Compaq, Dell and IBM.

Novell: www.novell.com/catalog/qr/snc30001.html

IPv6,
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endeavor for network managers. The transition to IPv6 is a huge task that will require users to update IP on every device on the network. This requirement is widely recognized as one of the huge drawbacks for IPv6.

The Internet Engineering Task Force (IETF), which has completed work on IPv6, revealed its decision to develop RSIP as a backup plan for IPv6 in a draft document posted on its Web site last month. The document details an invitation-only meeting that the IETF's Internet Architecture Board held in July to consider a variety of scenarios, from full migration to IPv6 to complete failure of IPv6.

"This represents the first time the IETF has seriously and formally examined the possibility of IPv6 not succeeding," says Noel Chiappa, a participant in the July meeting and a former area director for the IETF. "Before we had Plan A — IPv6 — and there was no Plan B. Now we're starting to work on one."

As part of its contingency planning, the IETF made several recommendations to allow the network layer of the Internet to support more users and applications until IPv6 is deployed. One key recommendation was to speed up RSIP development.

"The IETF is proceeding with cautious optimism on RSIP," says Mike Borella, a senior engineer with 3Com's advanced technologies group and one of the authors of the protocol. "They've given us their blessing to continue the work."

At the heart of the debate over IPv6, RSIP and NAT is the fact that Internet address space is running out. How fast space will run out has been the topic of much debate over the years. Within the IETF, projections vary from two years to 20 years.

IPv6 solves the addressing problem by replacing the 32-bit addressing scheme in IPv4 with 128-bit addressing. The larger address space allows for an exponential number of devices to be connected directly to the Internet.

After six years of development work, the IETF recently finished defining IPv6 standards. However, few compliant products are available and only a handful of end users have adopted IPv6.

Because IPv6 products were not widely available to solve the Internet address shortage, many network managers deployed NAT devices as a quick fix. IETF leaders say NAT devices are so prevalent that they could cause serious problems for the growth of the Internet over the long term. The 'Net was designed so every device would have a unique address; with NAT this is no longer true. NAT also prevents end-to-end security and makes it harder to deploy new Internet applications.

"Ultimately, translation-based scenarios lead us to a problem," says Brian Carpenter, chair of the IETF's Internet Architecture Board and program director for Internet standards and technology at IBM. "It's not a crisis this week or next week . . . but long term it will create difficulties."

RSIP was introduced to the IETF 18 months ago by 3Com, but it was just last month that the protocol was given the blessing of the IETF's top leaders as a potential replacement for NAT and a step toward IPv6. NAT does not currently have a transition path to IPv6; RSIP allows for one and makes it so NAT and IPv6 aren't mutually exclusive.

The IETF's Brian Carpenter says translation could lead to problems.

"We were assuming a transition between IPv4 and pure IPv6," Carpenter says. "The good news is that there is also a transition path from NAT and RSIP to IPv6."

Enterprise users also are interested in RSIP as a replacement for NAT. Robert Cooper, a project leader with Indianapolis Power and Light, uses a 3Com OfficeConnect ISDN LAN modem with built-in NAT to dial out over the Internet from any of the machines on his 12-client network at home.

From his network, Cooper can access any of the computers in the company's power plants to check system health or conduct remote programming. "I would be very interested in RSIP because I wouldn't have to run through hoops to get encryption," he says.

Arlington Industries, a distributor of imaging supplies based in Libertyville, Ill., is using the NAT features of Secure Computing's Sidewinder firewall to hide the private Internet addresses of its 100 employees behind a single public Internet address. Network administrator Chris Kozlov says he would be interested in RSIP because it would let him encrypt all Internet traffic, including Web surfing. "We'd like to be encrypting users regardless of the type of content," he says.

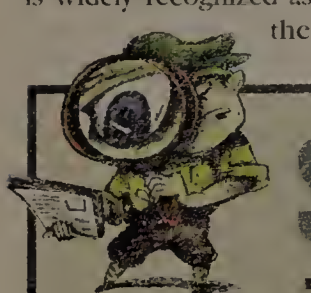
Until RSIP is finalized, which will likely be another year, IETF leaders are encouraging end users to think twice before deploying NAT.

"If you have NAT in your enterprise and your business partner has NAT, there may be some applications that you develop or buy that will not work [because of interoperability problems with NAT]," says Matt Holdrege, chair of the IETF's NAT working group and manager of technology development at Lucent Internetworking Systems.

For example, NAT doesn't allow for end-to-end security applications, nor does it support any Internet protocol that puts addressing information in the body of the packet rather than the header.

Meanwhile, the IETF is evaluating protocol enhancements that would make NAT devices work better.

"I think RSIP, while interesting, is less likely to be the key part of the eventual path forward than NAT simply because using it means you have to modify the end hosts," Chiappa says. "That is the great charm and benefit of NAT, and it's the reason it's most likely to succeed." ◪



The Scoop

The news behind the news

WHAT IS RSIP?

The Realm Specific Internet Protocol (RSIP) is a proposed standard under development by the Internet Engineering Task Force as a replacement for Network Address Translation (NAT). To understand the pros and cons of RSIP, you first need to know how NAT works.

NAT can be used to aggregate many private Internet addresses through a single public Internet address, or to mask a private Internet address behind a different public Internet address. NAT proliferated across the Internet during the past five years as a practical solution to the problem network managers were having getting unique Internet addresses for network devices. Because unique addresses were not readily available or were too expensive, some organizations assigned their own, private Internet addresses and used NAT to interface between their private Internet addresses and their official public Internet address.

Today, NAT is widely used in enterprise networks, as well as branch and home offices. NAT is a feature in most routers and firewalls, as well as some modems. Even Windows 98 ships with a NAT service.

While it is a viable workaround for the Internet address shortage, NAT has several limitations. Most importantly, NAT does not work with the IP Security (IPSec) protocol. This is because IPSec supports end-to-end encryption and doesn't allow for a device in the middle of the transmission to stop a packet and modify the address inside. Other emerging Internet protocols — for teleconferencing, instant messaging, streaming media and telephony — will not work with NAT without an additional layer of software, known as an application layer gateway, being loaded in the NAT device. In addition, NAT degrades network performance because the NAT device must change the Internet address on every packet of information entering or leaving the network, slowing the speed of the packets.

Invented by 3Com, RSIP is designed to solve the problems associated with NAT while still allowing an organization to assign private Internet addresses that differ from the public Internet address. (RSIP has no relation to Session Initiation Protocol (SIP), the IP telephony signaling protocol.) With RSIP, network clients prepare packets to be sent out over the Internet. The RSIP router uses information in the packet header to allow Internet address sharing, but it doesn't modify any information in the packets. This is key to enabling IPSec and also lets RSIP support other emerging Internet protocols. Another plus is that RSIP can co-exist with NAT, easing the transition to the new protocol. The only drawback with RSIP is that it requires software to be installed on the client and the host server, while NAT is done by the network device alone.

Some RSIP prototypes are under development, but it will be at least six months to a year before RSIP products are available, according to authors of the protocol.

— *Carolyn Duffy Marsan*

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White House proposes easing encryption export regulation

BY ELLEN MESSMER

WASHINGTON, D.C. — The White House last week unveiled plans to ease the current export restrictions on software and hardware products that make use of encryption.

The proposed export rules still need to be incorporated into Department of Commerce regulations, which will be published this December. These proposed rules would not completely lift existing export prohibitions that vendors and users confront concerning encryption use. But the revisions would greatly simplify what has become a bureaucratic morass of reporting requirements about the user to the Commerce Department. The product vendor or a lawyer specializing in this is usually the one dealing with the red tape on behalf of the user.

With the proposal, the government will no longer require vendors to obtain an export license to ship hardware using 56-bit encryption or less out of the U.S. to about 180 countries.

On the software side, an export license will no longer be required for software using 64 bits or less. This decision reflects a recent international agreement between several nations on encryption strength acceptable for import. But because this encryption strength is known to be breakable, users tend to want something stronger.

For software and hardware using stronger encryption, "we can obtain a general license for general export to friendly nations with no key-length restriction after submitting the product for a one-time review," says Bill Crowell, CEO at Cylink.

Crowell chairs the President's Export Control Subcommittee on Encryption and is a member of the President's Export Council, a group of about two dozen industry and congressional participants advising the White House. Crowell is also former deputy director at the National Security Agency, the government intelligence organization that has significant influence in setting encryption export policy for the U.S.

Crowell says the government review process for products with no key-length restrictions will not require vendors to use any type of key escrow process that would give law enforcement access to encrypted data.

"It gives us a level playing field with regard to our competition in the area of electronic commerce," Crowell says. "This is a very broad and sweeping relaxation."

One of the main advantages to the proposed rules will be abolishing the mass of Commerce Department regulations that categorize users into types — banking, insurance, e-commerce, medical and other. These categories of users have each been subject to different sets of restrictions.

When it comes to strong encryption, vendors currently have to make individual applications based on customer type and key length. Kelly Blaugh, director of government affairs at Network Associates, says that under the current rules, only "certain customers, not a wide customer base" are allowed to use exported products with 128-bit encryption or higher. ◪

Smart card,
continued from page 1

eventually be the key used to physically enter restricted buildings.

Corporations are bound to follow the Defense Department's smart card lead, particularly contractors that share access to government networks. Civilian employees working for the military may soon begin using the smart cards, too.

Deputy Secretary of Defense Hamre is expected to announce the services' conversion to smart cards.

For three years, the U.S. military has conducted operational testing of smart cards for network access, as well as for storing medical information and for use as digital cash. Now the Pentagon, which sets technical strategy for the armed forces, is aiming to achieve what is probably the largest smart card rollout in history. The Defense Department considers the rollout an important part of its commitment to fully adopt electronic commerce.

Desktops will need a card reader into which users will insert their smart cards, which will contain digital certificates and applications such as Novell NetWare log-on scripts.

While the cards provide an extra measure of security and portability, passwords will still be necessary to use the digital certificates. Those certificates also let the user digitally "sign" or encrypt applications. In addition, the Pentagon wants this smart card to be so intelligent that it can let its holder into a restricted building. The General Services Administration has been given the task of defining a government standard for the card.

"We want the smart card ID card to also support building access," says Marv Langston, deputy assistant secretary of defense. "This one common card will also be for standard access to the network."

One factor driving the conversion from plastic IDs to crypto-based smart cards is the fact that the Internet has made it easy to get fake military IDs. "We cannot trust the ID card anymore," says Rob Brandewie, deputy director of the Defense Manpower Data Center West in Monterrey, Calif., which maintains an Oracle database, servers and mainframes to keep track of more than 250,000 personnel changes every day. "At a site called fakeid.com, for instance, you can get military ID cards for about $75."

The formidable job of converting from plastic IDs to smart cards — expected to be formally announced this week by the Defense Department's top gun on technology issues, Deputy Secretary of Defense John Hamre — has already quietly begun.

The Defense Manpower Data Center provides remote access to the proprietary client-based Real-Time Automated Personnel ID System (RAPIDS), which each year churns out three million plastic ID cards, which double as passports for soldiers. RAPIDS interfaces with the Defense Enrollment Eligibility Reporting Systems (DEERS), a database that tracks 13 million current and retired personnel globally in terms of their location and benefits eligibility.

Brandewie says his data center has demonstrated it can take the information from existing systems and use it to issue smart card IDs instead of the plastic ones. The DEERS database is also being used to store each military employee's fingerprint as a 500-byte compressed image.

This fingerprint will go on the smart card ID as the biometric for fingerprint-based authentication in the future. The idea is that no one will get a digital certificate for their smart card until they can prove their identity by passing a network-based ID check based on fingerprint biometrics.

The smart card — whether from GemPlus, Schlumberger or other vendors — has become a commodity, says Martha Neal, deputy director of the Defense Department's smart card technology office.

"They're $3 apiece now, down from $5 a year ago," Neal says, adding that storing multiple applications on the cards is the way to hold down costs.

The Defense Department will now establish what it calls the Configuration Management Control Board, which will define the smart card's memory and application specification and a Web-based certificate authority — a huge technical challenge.

Public-key infrastructure products from Netscape, called iPlanet, are licensed to the Defense Department and will be tested at the Defense Manpower Data Center next month for issuing digital certificates on smart cards.

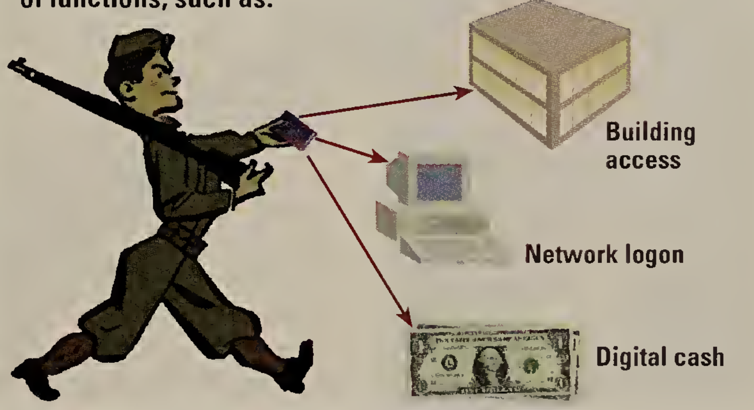
There is an expectation that smart card IDs that can store a soldier's military records will reduce the paperwork load because networked applications will be able to upload the soldier's ID and download new information related to training or credentials.

Col. Greg Miller, who works at the Air Expeditionary Force Battle Lab at Mountain Home Air Force base in Idaho, hopes "the hand-carried smart card will offer the benefit of one-time data entry."

Barbara Straw, director of dispersing at the Naval Systems Command Supply, assisted in a pilot project on the USS Yorktown, which got ATM-like machines to dispense digital cash directly into a sailor's smart card in place of paper money. The digital cash is used on board to buy items in the closed world of the carrier at sea. Straw says she would like to see a standardized "electronic cash purse application" on the military smart card, too. ◪

Not your father's dog tags

The Department of Defense is developing a universal smart card to replace military ID cards. The cards will carry a chip with the soldier's personal information, to be used in a variety of functions, such as:



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Backspin

For sale: One cranky columnist

As if eBay didn't have enough to worry about with service outages and failures, it also has to contend with people trying to sell illegal items. And not just any illegal items — we're talking about body parts.

I love this stuff. I mean where else but the Internet would such a situation arise? Apparently, eBay and the other auction sites are faced with a continuous stream of illegal postings. Things such as military weapons (a missile, a bazooka and a rocket launcher), born and unborn children, and human organs such as livers and kidneys.

While most of these items get some kind of news coverage, it was actually the kidneys that made the big time. It all started on Aug. 26 when somebody going by the handle of "hchero," supposedly from Sunrise, Fla., offered one of his kidneys for a minimum price of $25,000.

MARK GIBBS

Hchero described his offer thusly: "Fully functional kidney for sale. You can choose either kidney. Buyer pays all transplant and medical costs. Of course, only one for sale, as I need the other one to live. Serious bids only."

The bidding climbed to the dizzying height of $5.6 million before eBay killed off the auction. The reason? It was illegal. Under federal law, selling one's own organs (or, for that matter, anyone else's) is punishable by up to five years in prison or a $50,000 fine.

Indulge me in a slight digression here: Doesn't that strike you as odd? Your organs are, after all, yours. Why shouldn't you be able to sell them if you wish?

This is in the same category as other victimless crimes. (I highly recommend *Ain't Nobody's Business If You Do,* by Peter McWilliams, a remarkable book on the history and consequences of victimless crimes.) Consider the laws against suicide — you can be locked up for attempting to take your own life. What a ridiculous state of affairs! And don't get me started on the mistreatment of Dr. Jack Kevorkian . . . but I digress.

But even though you won't be seeing any more kidney auctions on eBay or any other U.S. online auction house, you can expect to see many more offers for organs made on Web sites located outside the U.S.

At some point, some enterprising company in Russia or South America will open an online human spare parts bank. Want a corneal graft, a liver transplant or a kidney replacement? No problem, as long as you have the cash.

What will be really interesting is when the politicians get involved. Just wait, you'll find the likes of our old friends Orrin Hatch and Diane Feinstein sponsoring half-brained bills to embargo countries that allow such trading (and by the way, note that no politician to date has gotten too worked up about doing something about countries that still practice barbarities such as female circumcision — go figure).

Perhaps that's the way to get some of these neglected issues addressed . . . just tie them to the Internet in some manner and wham, politicians will be all over the topic. So let's see. Perhaps I should be offering the following on eBay: "For sale, gross imbalance of wealth. Bidding to open at minimum wage."

Anyway, be that as it may. The other aspect of the kidney-for-sale story was that eBay suggested it was probably a hoax. While I know that eBay is a prime location for jokes and hoaxes (I recently saw: "For sale: One small wood screw with stripped threads. No minimum bid."), I suspect that there are a lot of people who really would be willing to sell their organs and plenty of others willing to buy.

Without further ado, let me ask: What price for one cranky British columnist in good working condition? Reserve price: $1,000,000. Bids to nwcolumn@gibbs.com.

'NET BUZZ

The latest on the Internet/intranet industry

PAUL MCNAMARA

Even the trade shows that aren't in Las Vegas look more and more like The Strip every year. In fact, the vendors competing for attention at last week's NetWorld+Interop '99 Atlanta exhibited all the subtlety of Hurricane Floyd.

Skycache — an Internet start-up satellite broadcasting company that promises the equivalent of "a T-3 to your rooftop" — spent "somewhere south of $100,000" to hire Vegas headliners **Penn & Teller** for three half-hour Wednesday performances at its booth, according to Marketing Director **Doug Mohney.**

Why? "We have to break through all that noise," Mohney explained Tuesday while pointing to the adjacent **Alcatel** booth, where a carnival was underway and drawing a huge throng of giddy time wasters.

"At least I can be sure that I'll get big crowds tomorrow with Penn & Teller," Mohney said.

And a mob scene the magicians did conjure up, whether or not anyone actually bought any satellite time.

After their last show of the day, Penn was busy signing autographs so I took the opportunity to interview Teller, even though the little guy is not exactly known for his loquaciousness or network knowledge.

Buzz: "So what's your take on all this convergence hoopla?"

Teller: (Crosses arms, looks exasperated, elbows Penn in the ribs.)

Buzz: "I take that to mean you're skeptical. What about VPNs: ready for prime time?"

Teller: (Arches eyebrows, coughs up a string of sewing needles, plunges five-inch carving knife into the back of Penn's hand. . . . Penn goes on signing.)

Buzz: "Thanks for your time."

Oh, just to show that I was actually working, I did learn this: Skycache — whose investors include Intel and Internet Venture Partners — "will probably start the IPO discussion sometime next year," Mohney said.

With his company on a buying binge over the past year, Lucent CEO **Rich McGinn** told an Interop keynote audience that he has fielded his fair share of "stock-tip, insider trading-type" inquiries from all quarters: "Well, who are you going to buy?"

One instance in particular "was a **Connie Chung-type** question: 'Just whisper it to me,' " recounted McGinn, who was sporting a very un-CEO-like blue-checkered shirt with an orange patterned tie.

Needless to say, McGinn put his fiduciary responsibilities and fear of federal prison ahead of any urge to gossip.

That's fine. . . . While Buzz doesn't want anyone to go to jail either — except maybe for O.J. and the president — readers should still feel free to push the envelope in telling me what they know.

McGinn also made an interesting prediction: He says it won't be long before someone offers free stock trades online.

These four rules were posted on signs outside the show floor: No smoking; no cameras; no soliciting; no one under 18.

Now the first one makes sense. This is the '90s and people should not be allowed to pollute the air in public convention halls just because they can't shake the nicotine monkey.

The second one, which doesn't apply to us media types, seems a bit . . . uh, what's a more polite word for anal? Still, my guess is most network executives can live without a pile of snapshots from their trip.

No soliciting? Exactly whom are convention organizers trying to kid? Interop is nothing but one giant solicitation. In fact, more soliciting happens on the Interop show floor than at all of Atlanta's world-renowned strip clubs combined.

As for the "No one under 18" business, that rule makes no sense whatsoever, especially since it kept the CEOs of at least three Internet start-ups from visiting their own booths.

This column has only one rule: You must send your news tips to McNamara at (508) 820-7471 or buzz@nww.com.

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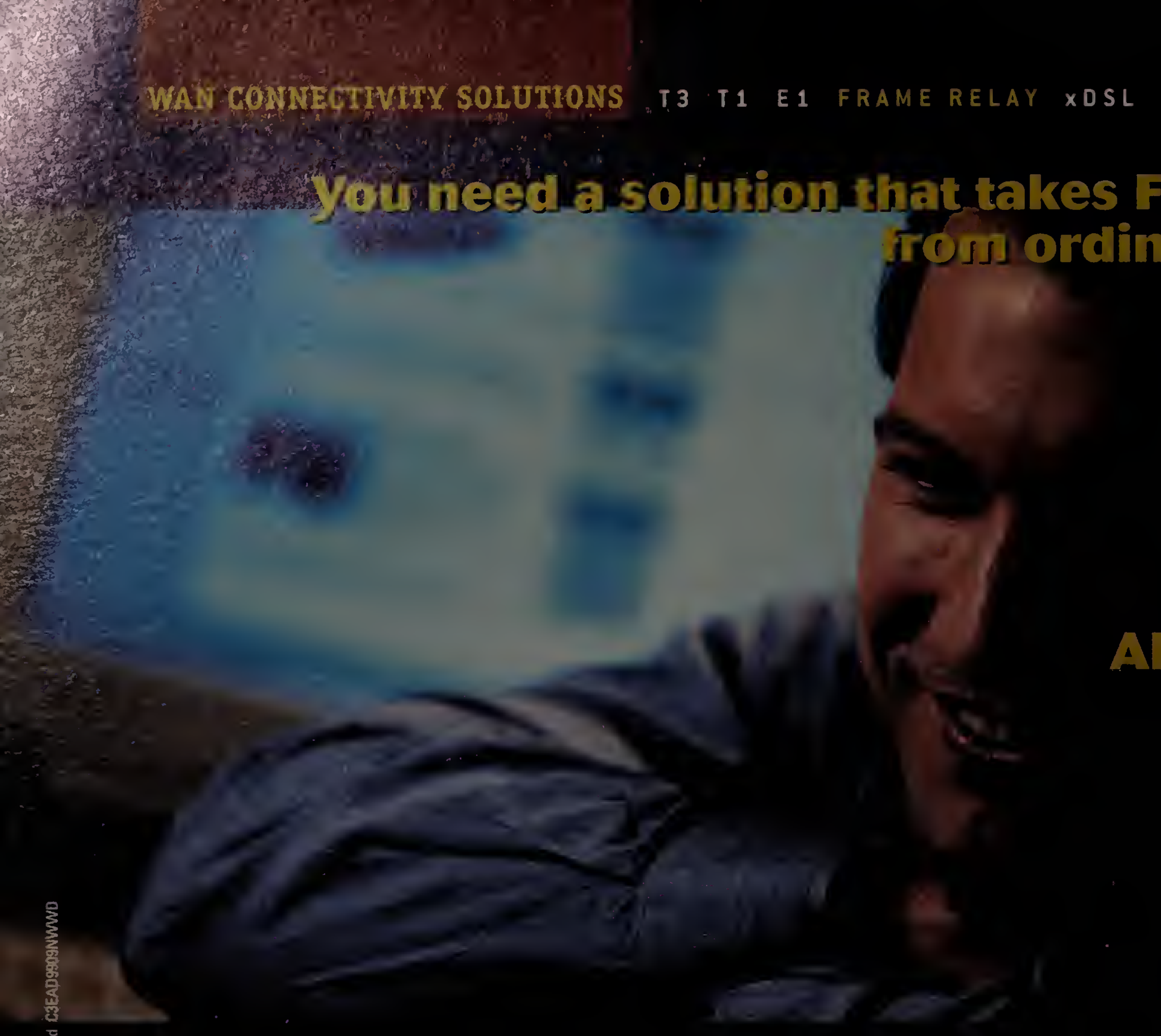

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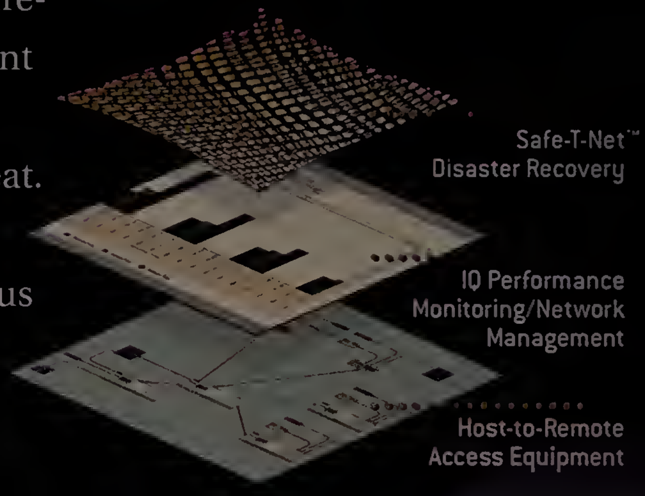

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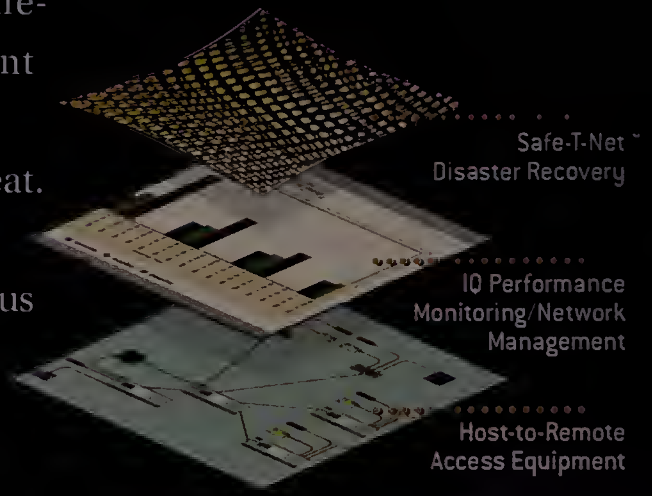

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